107 cop - Oct-Dec

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THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 107, No. 14

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535 North Dearborn Street, Chicago, Ill.

OCTOBER 3, 1936

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year. 25c a copy. Canadian $8.50. Foreign $11.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

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The Journal of the American Medical Association

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VOL. 107, No. 14 — COPYRIGHT, 1936, BY AMERICAN MEDICAL ASSOCIATION CHICAGO, ILLINOIS — OCTOBER 3, 1936

THE PROBLEM OF LONG CONTINUED, LOW GRADE FEVER

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PHILADELPHIA

The problem of diagnosis in patients with long continued, low grade fever occurs far more commonly than one would be led to believe by the few studies that have been reported dealing exclusively with the subject. Controversy exists regarding the range of body temperature found in normal persons and the limits beyond which disease may be suspected. The present study deals with persons whose maximal or whose average oral temperature is higher than the accepted norm.

Since the time of Wunderlich, sixty-five years ago, many have shown that a certain proportion of normal persons may have temperatures regulated at levels slightly higher than 37 C. (98.6 F.).[1] There are, on the other hand, clinicians who are skeptical of this view and believe that any rise above this level should be regarded as evidence of actual disease.[2] They are correct in pointing out the danger of regarding normal hyperthermia as a diagnostic refuge when no cause can be found for persistent low grade fever. Yet it seems unlikely that a fixed level of body temperature represents the normal for all. Differences are known to exist in a number of measurable factors concerning any group of individuals. Variations in pulse rate, respiration rate and blood pressure, for example, are too well known to require further mention. There is, therefore, basis for the prediction of the existence of persons whose temperature may be regulated normally at levels slightly under or slightly over 37 C. (98.6 F.). When a curve is prepared to show the percentage probability of occurrence of oral temperature in a normal population, as shown in chart 1, it appears that the oral temperature of about 60 per cent of normal adult persons rests between 36.8 C. (98.2 F.) and 37.2 C. (98.9 F.). The spread beyond these levels is considerable in both directions, with the incidence of probability diminishing toward extremes of 36.1 C. (97 F.) on the one hand and 37.9 C. (100.2 F.) on the other.

Several investigators who have studied prolonged, low grade fever as a diagnostic problem have selected for discussion hospital records or records from their practice.[3] Many patients were obviously ill and the temperature ranged between 37.8 C. (100 F.) and 38.4 C. (101 F.), which is beyond the predicted normal range. In a large proportion of such cases, diagnosis of infection or neoplasm was eventually made. These results suggested that temperature persistently exceeding 37 C. (98.6 F.) is of serious import and only under the most exceptional circumstances should it be regarded as normal in any given case. In the present investigation the problem was approached from a different point of view, and different impressions were gained. A deliberate attempt was made to seek out individuals with prolonged subfebrile temperature, rarely exceeding 37.2 C. (100 F.), and to study each case intensively at repeated intervals over long periods. Of the sixteen patients thus far studied, all were women, ten of whom were unmarried. Two general types have emerged: (*a*) five patients who had no complaints and were regarded as otherwise healthy and (*b*) eleven who were regarded as neurotic, who had a multitude of bizarre complaints for which no cause could be found after prolonged search with all the diagnostic methods available.

In studying this group of persons, efforts were made to determine whether hyperthermia represented normal temperature or whether actual fever and underlying disease were present. The problem was especially difficult in neurotic patients who, in addition to hyperthermia, had numerous other complaints. A number of infectious and other diseases were considered as possible causes for the fever, the more common of which were tuberculosis, undulant fever, rheumatic fever, syphilis, neoplasm and brain disease.[2b] The influence of various endocrine gland disturbances on regulation or alteration of the temperature also was considered. There is no doubt that both the thyroid and the adrenal glands may play a rôle. Most observers who have studied the temperature in relation to the menstrual cycle have noted a rise in the level during the latter half of the intermenstrual period, often to fever levels.[4] Fekete,[5] who recently reviewed some of the literature on the subject, suggested oversecretion of the anterior lobe of the hypophysis as the

From the Department of Medicine, University of Minnesota Hospital.

Read before the Section on Practice of Medicine at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. Williams, M. H.: A Note on the Temperature of 1,000 Children, Lancet **1**: 1192-1194, 1912. Zimmermann, H.: Die obere Grenze der "normalen Körpertemperatur," München. med. Wchnschr. **77**: 2051-2055 (Nov. 28) 1930. Nirenstein, E.: Schwerwiegende Irrtümer bei ambulatorischer Bestimmung der Körpertemperatur, Med. Klin. **27**: 1707-1711 (Nov. 20) 1931. Poelchau: Temperaturbeobachtungen in eigenen Familie, Med. Klin. **30**: 574-576 (April 27) 1934. References to other papers are given in footnote 8.

2. (*a*) Saathof, L.: Ueber die Notwendigkeit einer einheitlichen Temperaturmessung und über die Grenze zwischen normalen und pathologischen Temperaturen, München. med. Wchnschr. **61**: 1771-1774 (Aug. 11) 1914. (*b*) Mester, E.: Ueber Subfebrilität, Med. Klin. **22**: 1709 (Nov. 5) 1926. (*c*) Paton, J. H. P.: The Mean Temperature of Healthy Girls, Brit. M. J. **2**: 142-144 (July 23) 1932. (*d*) Kintner, A. R., and Rowntree, L. G.: Long Continued, Low Grade, Idiopathic Fever, J. A. M. A. **102**: 889-892 (March 24) 1934. (*e*) Carr, J. C.: Symptoms and Diagnosis of Obscure Fever, Illinois M. J. **68**: 446-453 (Nov.) 1935. (*f*) Hamman, L., and Wainwright, C. W.: Diagnosis of Obscure Fever, Bull. Johns Hopkins Hosp. **58**: 109-133 (Feb.) 1936.

3. Kintner and Rowntree.[2d] Carr.[2e] Hamman and Wainwright.[2f]

4. Giles, A. E.: The Cyclical or Wave Theory of Menstruation, with Observations on the Variation in Pulse and Temperature in Relation to Menstruation, Obst. Tr. **39**: 115-124, 1897. Zuntz, L.: Untersuchungen über den Einfluss der Ovarien auf den Stoffwechsel, Arch. f. Gynäk. **78**: 106-136, 1906. King, J. L.: Concerning the Periodic Cardiovascular and Temperature Variations in Women, Am. J. Phys. **34**: 203-219, 1914. Cullis, W. C.; Oppenheimer, E. N., and Ross-Johnson, M.: Observations on Temperature and Other Changes in Women During the Menstrual Cycle, Lancet **2**: 954-956 (Nov. 4) 1922.

5. Fekete, A.: Ueber prämenstruelle Temperaturerhöhungen, Monatschr. f. Geburtsh. u. Gynäk. **99**: 29-40 (March) 1935.

cause, and empirical attempts [6] have already been made to control the premenstrual temperature rise with glandular substances.

In studying these patients, aside from a careful history and long and repeated clinical observation and examination, a number of other factors and data were especially helpful in diagnosis. They included registration of several temperature readings daily for at least a month at repeated intervals, morphologic and

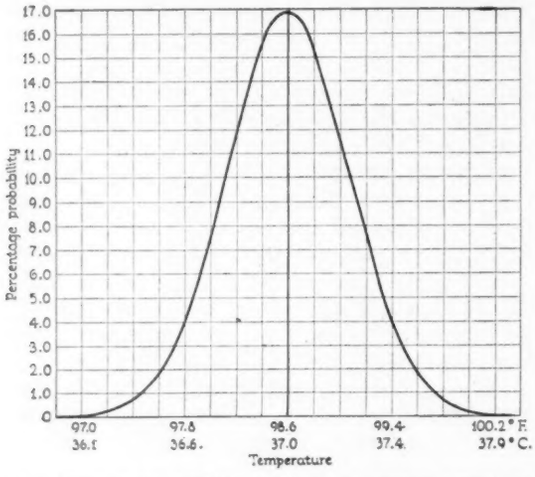

Fig. 1.—Curve of the probable incidence of average normal oral temperature constructed from a table prepared by Dr. Frances Vanzant.[5b]

numerical studies of blood cells, determination of the blood sedimentation rate, Wassermann reaction and various agglutinins, intradermal tests for tuberculosis and brucellosis, basal metabolic rate, constancy of body weight, and any special procedures as dictated by the individual case. The drug tests of Holló and Holló-Weil,[7] depending on the antipyretic effect of certain drugs on fever of infectious origin and of opium in

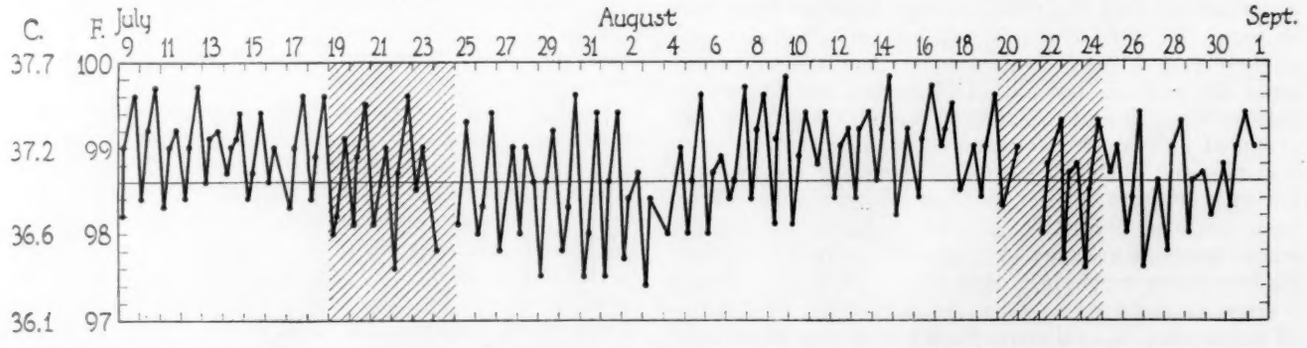

Fig. 2.—Fifty-six day oral temperature record including two menstrual periods (shaded areas) in case 3. The rhythmic relationship of the temperature to the menstrual cycle is shown. The temperature level is generally lower during menstruation and the first half of the intermenstrual period.

depressing normal temperature, have been helpful, but like all other tests they are not infallible.

To illustrate the problem of diagnosis in cases of prolonged fever, a few illustrative reports are given:

PROLONGED FEVER IN OTHERWISE NORMAL PERSONS

CASE 1.[8]—Miss B. E., aged 31, had been regarded as a potential invalid with possible tuberculosis for nineteen years because of persistent low grade fever. After a complete examination no abnormalities aside from subfebrile temperature were detected during several periods of observation. In the five years following my first examination the patient has been well, except for occasional colds. Her temperature still registers over 37 C. (98.6 F.), as it has done for twenty-four years.

CASE 2.—Mrs. M. Z. (record furnished through the courtesy of Dr. Reuben Johnson), was operated on in 1932 for acute appendicitis, followed by pain in the abdomen, probably due to oophoritis, with leukocytosis of 12,000. The pain and leukocytosis disappeared after six months. Ever since the operation she noted slight fever in the afternoon, averaging 37.6 C. (99.6 F.), and almost always lower in the first half of the intermenstrual period. There were no complaints and no abnormal physical signs were found except the elevated temperature. The Mantoux test, agglutinins for Brucella, numerous roentgenograms of the chest and sinuses and urinalysis were negative and the basal metabolic rate was normal. In May 1936 her temperature measured during a period of two weeks averaged 37.3 C. (99.2 F.). The patient is well and carries on her daily work without difficulty.

CASE 3.—Mrs. M. A., aged 28, first noted an elevation of temperature in 1932 during the course of an examination to determine the cause of dysmenorrhea. Because the temperature reached 37.2 C. (99 F.) or over daily, her physicians examined her repeatedly for tuberculosis without positive results. The temperature when measured was often higher than normal and caused the patient considerable apprehension. There had not been any cough, loss of weight or other symptoms except those of dysmenorrhea, which have improved since 1932.

The patient by request entered the hospital for two days, where an examination revealed no abnormalities. All laboratory studies were negative. The patient then returned home to her usual work and recorded her oral temperature twice daily for fifty-six days, including two menstrual periods. With only two or three exceptions, the afternoon temperature exceeded 37 C. (98.6 F.), but was never above 37.6 C. (99.6 F.). The typical rhythmic relation to the menstrual period was observed, as shown in chart 2. During the first half of the intermenstrual period the average temperature was consistently lower than that during the latter half.

CASE 4.—Miss J. V., aged 17, had an ovarian cyst removed in February 1934, following which she promptly recovered. In July she became tired and sleepy in the afternoon. In August a physician found her temperature to be elevated and instituted a search for the cause. The temperature was found to be elevated daily, usually between 37.2 C. (99 F.) and 37.6 C. (99.6 F.), rarely reaching 37.8 C. (100 F.). No symptoms were noted except "feeling a little warm" when the temperature was highest. Correction of rather marked secondary anemia by appropriate medication relieved the asthenic symptoms completely. She was given compound solution of iodine for two weeks without any effect in the temperature level. Her systolic blood pressure on several occasions was reported as 160, 140 and 148. The menstrual periods were normal. In December the left maxillary sinus was punctured twice to no avail. The patient was referred to the University Hospital by Dr. Herman Drill in March 1935 for further study.

On physical examination she appeared to be normal and robust. No physical or mental abnormalities were detected. The pulse rate was 96 per minute; the blood pressure was 128 systolic and 96 diastolic. All roentgenographic and laboratory

6. Menninger-Lerchenthal, E.: Prophylaxe gegen den aggravierenden Einfluss der Menstruation auf latente und bestehende Krankheiten besonders Psychosen und Lungentuberkulose, Ztschr. f. d. ges. Neurol. u. Psychiat. **144**: 234-245, 1932.

7. Holló, J., and Holló-Weil, E.: Experimentelle Analyse du Subfebrilen Temperaturen und ihre Ergebnisse, Berlin. klin. Wchnschr. **55**: 640, 1918.

8. This case was reported in detail previously: Reimann, H. A.: (*a*) Habitual Hyperthermia, J. A. M. A. **99**: 1860-1862 (Nov. 26) 1932; (*b*) Habitual Hyperthermia, Arch. Int. Med. **55**: 792-808 (May) 1935.

tests, with the exception of the basal metabolic rate determination, were normal. The latter was recorded as —23 and —33 per cent of normal, while the temperature was 37.2 C. (99 F.). Desiccated thyroid in an amount of 0.12 Gm. per day was given, beginning March 17. Twelve days later the metabolic rate was —12 per cent and in April it was —17 per cent and 4 per cent. The temperature level was uninfluenced but the pulse rate was somewhat increased.

The diurnal temperature was measured at intervals of two hours and with one exception exceeded normal during the day, varying between 37.2 C. (99 F.) and 37.7 C. (99.8 F.). On three days it reached 37.8 C. (100 F.). The day on which the temperature remained low she had received powdered opium 0.12 Gm. and had slept most of the time. On the preceding day she was given aminopyrine 1.8 Gm. without any lowering of the temperature level. On two days when the temperature measured 37.6 C. (99.6 F.) she was obliged to climb and descend five flights of steps repeatedly for fifteen minutes. The result was paradoxical; on both occasions the temperature dropped to 36.7 C. (98 F.) after forty-five minutes. Epinephrine chloride 0.5 cc. of a 1:1,000 solution, given hypodermically, apparently caused an elevation in the temperature

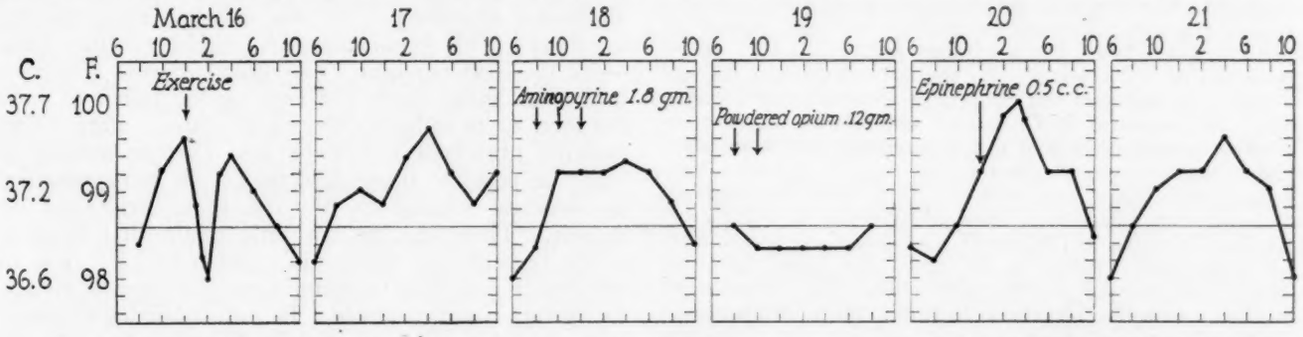

Fig. 3.—Oral temperature on consecutive days in case 4. A drop in temperature following exercise, the ineffectiveness of aminopyrine in lowering the level, a suppression of temperature by opium, an elevation caused by epinephrine and two control days in which no tests were made are shown.

level. Histamine 0.5 mg. had no effect. The tests are illustrated in chart 3. No changes were noted in relation to the menstrual period. Miss V. was seen again in April 1936. She was well, without complaints, but the temperature measured over a week's time reached 37.4 C. (99.4 F.) daily.

CASE 5.—Mrs. P. J., aged 26, was referred by Dr. Lawrence Cady for determination of the cause for prolonged low grade fever. She gave birth to an infant in February 1935 and was troubled with cystitis, which lasted about two weeks and disappeared. In December the patient noted that she tired easily on exertion. She lost 7 pounds (3.2 Kg.) but regained it rapidly. These symptoms were attributed largely to overwork and exhaustion. Rest in bed was found to relieve them. Tuberculosis was suspected. She measured her temperature and found it to vary from 37.4 C. (99.4 F.) and 38.1 C. (100.6 F.). She then recorded her temperature daily and noted herself that the level was generally higher in the week preceding her menstrual period and lowest during the week following. Her menstrual history is normal.

On examination the patient was found to be well developed and robust. She made no complaints except of tiredness after housework. No abnormalities were discovered. The pelvic organs were normal. The pulse rate averaged 72 beats per minute and the temperature during three days of observation under bed rest reached 37.3 C. (99.2 F.) only once. Subcutaneous injection of 0.5 cc. of a 1:1,000 solution of epinephrine hydrochloride caused an elevation of the pulse rate but did not influence the temperature. The blood count, sedimentation time and repeated urinalyses were negative. The Mantoux test with 0.1 mg. of old tuberculin was negative. The basal metabolic rate was —7 per cent.

The patient continued to record her temperature four times a day for forty days at home. The temperature at 7 a. m. was always subnormal, with the lowest levels recorded a week after the menstrual period. The afternoon temperature without exception ranged between 37.2 C. (99 F.) and 37.6 C. (99.6 F.), never exceeding the latter level.

The five cases just described concern persons in good health and without complaints, who are able to undertake their daily tasks without difficulty but who have diurnal oral temperatures which persistently reach levels higher than 37 C. (98.6 F.). Because of this, tuberculosis was suspected in each instance.

PROLONGED FEVER IN NEUROTIC PERSONS

CASES 6, 7 and 8.—(Misses R. L., K. U., and E. R.) were reported in detail previously.[8b] Miss K. U., after leaving the hospital in April 1934, has returned to the outpatient department seventy times to date, visiting various divisions for various complaints. No new information was recorded. Her temperature still registers between 37.2 C. (99 F.) and 37.6 C. (99.7 F.), at which level it has apparently been for nine years. Miss E. R. was visited at her home in April 1936. Her complaints were unchanged and her temperature measured 37.2 C. (99 F.). Elevated temperature was first noted sixteen years ago.

CASE 9.—Miss K. M., aged 30, apparently had some emotional disturbances of undetermined nature while in school in 1924. Her parents were in financial straits and were partially dependent on the patient for support. She was obliged to earn money by teaching in addition to her schooling. Within the past few years it was said that her physiognomy had changed considerably, involving considerable loss of attractiveness and the development of a beard and hair on the extremities. Of late she has shunned male companions and has withdrawn from old friends of her own sex.

In December 1934 while under a heavy teaching load she developed some mild infection characterized by transient diarrhea, a fainting spell, and periods of sweating. Her temperature was found to be 37.8 C. (100 F.). Since then the patient has not been able to work. Her physician regarded her case as nervous exhaustion. She went to bed, where she remained eight months, complaining of intense weakness to the extent of being unable to lift food to her mouth. She also noted sharp pains and pulling sensations in the heart and tightness in the neck when excited. She was admitted to the University Hospital in July 1935.

On physical examination the patient was fairly well developed and was not remarkable except for slight hirsutism of the face and extremities, a greasy skin and facial acne. The hands and feet were cold and moist. There was marked dermographia. Psychiatric examination revealed a psychoneurotic personality. Otherwise no abnormalities were found. The laboratory and x-ray studies were negative. The pulse rate usually ranged between 90 and 100 and occasionally rose to 140 after the exertion of sitting up, for example. The temperature when registered at intervals of two hours during the day for the seventy-five days of observation without exception exceeded 37 C. (98.6 F.) in the daytime, averaging 37.5 C. (99.5 F.) and rarely reaching 37.8 C. (100 F.). Exercise or menstruation had no effect in elevating the level, but powdered opium depressed the usual high afternoon level to 37 C. (98.6 F.). Aminopyrine 1.3 Gm. did not lower the level.

The patient recorded her temperature for six days in April 1936. It registered daily between 37.2 C. (99 F.) and 37.6 C. (99.6 F.). By this time she had regained considerable strength and was able to walk short distances.

CASE 10.—Miss E. E., aged 23, began to have at times a peculiar feeling of twitching and numbness in the muscles of her back in 1930. These attacks were frequent at first but

gradually diminished. She was nervous, worried, irritable, cried easily, was unable to sleep and had severe orbital headaches. In May 1935 the headaches and nervousness became worse. Later she noted an inability to "make her hands do what she wanted them to do," and there was a prickling sensation of the forearms. She began to fear insanity. These symptoms, she stated, were relieved by a tonsillectomy in August. In September she complained of indigestion and palpitation of the heart. A spinal puncture in October revealed normal spinal fluid. No refractive errors were found in her eyes. About this time her physician noted an elevation of temperature and requested her to keep a record for two months. This was done, and with one or two exceptions the temperature rose to levels over 37.2 C. (99 F.) daily and exceeded 37.8 C. (100 F.) only once. The patient had been obliged to work hard for the past few years as a domestic servant and waitress, in addition to keeping house for an invalid father. She was well adjusted socially and rated high in high school work. The patient entered the University Hospital for study in December.

Her chief complaint was nervousness, indigestion, irregular menstruation, and vague pain in the lower portion of the abdomen. Her menstrual periods began at 12 years and were always irregular and sometimes painful. Intervals between the periods, which lasted for a variable number of days, varied from two to twelve weeks. On physical examination she was found to be intelligent and cooperative without undue nervousness. She appeared to be healthy and robust. Aside from marked dermographia, cold moist extremities and temperature higher than normal, no abnormalities were discovered. Neurologic examination was negative. Her pulse rate averaged 80 beats per minute and the blood pressure was 100 systolic and 80 diastolic, rising to 110 and 85 respectively one minute after her hands were immersed in ice water. The blood, urine and gastric contents were normal when tested. The sedimentation rate was normal. The basal metabolic rates determined in December were —35, —30, —6 and —27 per cent. She was given 0.18 Gm. of desiccated thyroid gland daily for nine days, after which the basal metabolic rate was still —27 per cent. The dose was doubled to 0.35 Gm. daily for two weeks, after which the rate rose to —7 and —9 per cent. From January 22 to January 29, 0.54 Gm. given daily caused the metabolic rate to rise to +6 per cent. In spite of the large dosage, her average pulse rate was increased only 10 beats per minute, there were no unusual symptoms and no influence on menstruation or on the temperature level. The patient continued taking desiccated thyroid 0.36 Gm. daily for three weeks after leaving the hospital. The temperature maintained its usual level.

CASE 11.—Miss E. McG., a student, aged 15, after having visited a series of physicians was sent to me for study in October 1935 by Dr. Moses Barron. In 1930 at the age of 10 the patient was taken to a tuberculosis clinic because of persistent elevation of temperature above normal, discovered during routine periodic public school examination. There was in addition a continual nonproductive cough. Her school life was then restricted because of a suspicion of tuberculosis. Four Mantoux tests performed at this time were negative and no other evidence of tuberculosis was ever found. Her temperature was more or less continually elevated, reaching 37.6 C. (99.6 F.) and sometimes 38 C. (100.4 F.). In 1935 she complained of frontal headache. The frontal sinuses were washed and the mastoid process was opened without any abnormalities being found and with no relief of headache. Incidental history concerns the fact that the patient was abandoned as an infant and was raised by sympathetic foster parents. The patient is aware of the facts and is distressed by them. Her menstrual periods are normal and regular. Her only complaints on questioning were frontal headache, cough, and deafness in the left ear. She was unaware of elevated temperature except by thermometry. On examination she appeared to be nervous, with constant twitching and a short, nonproductive forced cough. These symptoms were always more marked under nervous tension. The patient was later informed that her cough was unnecessary, since no cause was found to account for it. The cough promptly ceased and has not recurred to date, seven months later. A slight error of refraction was corrected without relieving the headache. Her pulse rate averaged 80 per minute. Aside from a slightly enlarged thyroid gland, no other abnormalities were detected. All laboratory tests, the Mantoux test and roentgenograms were negative. A psychometric report by Dr. Hathaway revealed an intelligence quotient of 110. Dr. R. C. Gray, the consulting psychiatrist, regarded the condition as a functional neurosis. The temperature was elevated daily, the peaks averaging about 37.5 C. (99.5 F.). There was no rhythmic relationship to the menstrual period. Epinephrine, aminopyrine, opium and strenuous physical exercise failed to alter the usual level.

Cases 9, 10 and 11 are described in considerable detail to illustrate the type of neurotic patient in whom hyperthermia was encountered. Several other similar patients are under observation whose records for want of space are not given in detail. One (case 12) concerns a student nurse (Miss E. M.) who had noted that her temperature when recorded at times since she entered the training school two years before was slightly higher than normal. She was regarded as suffering from a mild affective disorder. Examination and laboratory tests revealed no other abnormalities. Another patient (case 13, Mrs. M. M., aged 49) had had numerous abdominal operations. In this case hyperthermia was associated with basal metabolic rates varying from —22 to —38 per cent. Dessicated thyroid substance 0.18 Gm., given daily for two weeks, failed to raise the level or to influence the temperature. Three other patients presented symptoms and changes similar in many respects to those described. All were regarded as neurotic individuals by the psychiatrist and by myself. There can be but little doubt that neurosis is the outstanding feature in cases 6 to 13. It is of interest to note that with one exception each patient in this group was unmarried. In some patients, temperature elevation as discovered by thermometry was the chief source of concern, but in most it was noted by the physician in charge and was a minor factor in the case. The hyperthermia had been known to exist for from sixteen months to sixteen years in this group and was still present in each patient when recently measured. Each patient had visited many different physicians and many different diagnoses had been made. Tuberculosis had been suspected in each case at some time, and three patients had been confined needlessly in tuberculosis sanatoriums. After careful study at repeated intervals, no cause was found to account for fever.

Two patients, not included in this series, were studied because of prolonged fever. In one, a man aged 46, there was unmistakable evidence of infection with pallor, malaise, loss of weight and an increased blood sedimentation rate, although the leukocytes were normal and the fever failed to respond to aminopyrine. This patient had had prostatitis and a urethral discharge for years. Several months after examination, an acute prostatic abscess developed. Another patient, a woman aged 30, had had fever for six years, occasionally reaching 39.5 C. (103 F.). She complained of weakness and loss of weight. There was continual soreness and distress in the right hypochondrium and epigastrium. The leukocytes were normal but the sedimentation rate was 100 mm. in the first hour. Aminopyrine caused a prompt drop in the temperature from 37.9 C. (100.2 F.) to 35.2 C. (95.4 F.). The Wassermann reaction was found to be 4 + and after administration of potassium iodide the temperature returned to normal and recovery ensued. The diagnosis was syphilis of the liver.

COMMENT

In the sixteen cases reported, attempts were made to show that the maximal or the average oral temperature of certain persons otherwise physically well as far as could be determined is higher than the usually

accepted normal level. In most instances, hyperthermia was first detected when the temperature was measured because of some incidental infection or disease or in routine physical examination at school. It is probable that in many instances hyperthermia was present long before its detection. Persistence of the level over the normal initiated prolonged observation and search to determine the cause. In the five women regarded as normal who were free from complaints, the "fever" caused more apprehension to the person's family or physician than to themselves. It is difficult to escape the conviction that the temperature of these persons was normal for them, especially in case 1, in which hyperthermia has existed twenty-four years.

The diagnostic difficulties were multipled in neurotic patients as illustrated in the cases reported. Each patient represented a separate problem. Their numerous complaints necessitated careful and prolonged search to rule out the presence of underlying organic disease. Especial consideration was given to undulant fever because of the long duration, subfebrile temperature and neurotic symptoms known to characterize the occasional case. Tuberculosis is less likely to persist for years without becoming manifest.[2f] In some cases, even after complete studies were made without detection of physical abnormalities and the patient was informed of the facts, the complaints persisted, and advice was sought elsewhere as in cases 6, 7 and 8. The fact that temperature at fever levels persisted, in one case as long as sixteen years, suggests that hyperthermia in certain patients is part of the neurotic syndrome.[9]

Of interest was the low basal metabolic rate frequently found while the temperature was higher than normal, especially in cases 4, 16 and 13. Thyroid gland medication failed to alter the rate significantly, nor was the temperature influenced by the drug, as in the case reported by Lee.[10] None of these patients were myxedematous; each had menstrual disturbances and may perhaps be classed with the type of patient recently studied by Haines and Mussey,[11] although improvement after thyroid gland medication, as noted by these observers, did not occur.

As indicated in this study, it is of considerable practical importance to determine whether persistent temperature at levels higher than normal in a given patient is to be regarded as normal or whether actual organic disease is present. It is a serious matter, for example, to regard a patient as tuberculous and prescribe sanatorium care (cases 1, 7 and 11) on no other ground than that of fever. Furthermore, allaying the fear of nonexistent disease in patients with hyperthermia has resulted in a striking improvement in the emotional state of a number of my patients. Nevertheless, it should be reemphasized at this point that every possible diagnostic means should be employed in patients of the type here described to detect underlying, obscure disease before the temperature is regarded as normal or as part of a neurosis.

The question may be raised whether the term "habitual hyperthermia" or any term need be applied to the type of patient described. There appears to be no more reason to do so than to apply the term "habitual bradycardia" to normal persons with an average pulse rate of 60. They simply represent a class of individuals whose average temperature levels fall within the upper limits of the normal range of variation.

9. Saathof.[2a] Döblin, A.: Zur neurogenen Temperatursteigerung, Berlin. klin. Wchnschr. **49**: 2081-2083, 1912. Santos, R. N.: Ueber die Neuropsychogene Hyperthermie, Med. Klin. **27**: 1273-1274 (Aug. 28) 1931. Other references are given in papers referred to in footnote 8.

10. Lee, R. I.: Thyroid Dysfunction as a Cause of Fever, M. Clin. North America **10**: 1353-1355 (March) 1927.

11. Haines, S. F., and Mussey, R. D.: Certain Menstrual Disturbances Associated with Low Basal Metabolic Rates Without Myxedema, J. A. M. A. **105**: 557-559 (Aug. 24) 1935.

SUMMARY

A group of sixteen women whose oral temperature reached levels slightly higher than 37 C. (98.6 F.) for years was studied to determine whether or not infection or other organic disease was present to cause the fever. Five of those examined were apparently normal healthy women, but the rest were regarded as neurotic. The temperature in each case reached levels over 37 C. (98.6 F.) daily for months or years but seldom exceeded 37.8 C. (100 F) unless actual infection or other known cause intervened. Complete physical examination, long and repeated observation, roentgenographic studies and laboratory and biologic tests failed to reveal an underlying cause for the hyperthermia. It was concluded that a certain proportion of normal individuals have temperatures regulated at levels slightly higher than 37 C. (98.6 F.) and that temperature at these levels is often found in neurotic persons.

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ABSTRACT OF DISCUSSION

DR. A. C. ERNSTENE, Cleveland: Dr. Reimann has emphasized that his observations are not intended to offer a common diagnostic refuge when one is confronted with the problem of a long continued unexplained fever. The cases he has studied belong to a relatively small group, and in this group the procedure of repeated periodic observations that he has followed should be adopted. In the study of prolonged low grade fever, the erythrocyte sedimentation rate is of great value. As long as the rate is elevated, fever must be assumed to be due to an organic cause. On the other hand, a normal sedimentation rate does not exclude the presence of organic disease. In many individuals, for instance, in whom the weight of evidence indicates the presence of chronic undulant fever, the erythrocyte sedimentation rate is normal. In the study of prolonged low grade fever, special consideration must be given to the possible presence of chronic brucellosis, for the diagnosis of this condition is frequently difficult. Specific agglutinins may no longer be present in the blood serum when the patient is first seen. The intradermal test with undulant fever vaccine is a helpful diagnostic aid, but the results must be interpreted with care. The opsonocytophagic index is also of value. The length of time Dr. Reimann has had his patients under observation is sufficient to exclude tuberculous disease as a possible cause of the elevation in temperature. When tuberculosis is responsible for prolonged low grade fever, the true state of affairs either becomes manifest within a period of a few months or the fever subsides. In the past, considerable attention has been paid to focal infection as a possible cause of persistent low grade fever. Authenticated instances, however, in which the removal of foci, such as infected teeth or tonsils, have resulted in disappearance of the fever, are suggestively uncommon. It is probable, therefore, that focal infection does not cause prolonged low grade fever. Finally, the question arises whether one is justified in making a diagnosis of physiologic fever and dismissing the patient. In the absence of symptoms, I believe that such a course may be safely adopted, provided the patient has been under observation for not less than one year.

DR. RUSSELL M. WILDER, Rochester, Minn.: Dr. Reimann has made clear that the temperature of the normal human being, in health, fluctuates to a certain degree. This, of course, is not surprising. There are no physiologic constants that are really constant. The rate of the heart, the rate of respiration and the basal metabolic rate, which are called constants, all show more or less fluctuation. It would seem, however, that the range of fluctuation in the case of temperature is less than in these other physiologic constants, and that therefore when deviations are seen from what are regarded as normal temperature one ought to be extremely hesitant to conclude that such a deviation represents a normal fluctuation. The temperature of the body

is a resultant of a rate of production of heat by metabolism and the rate of its elimination. Either of these processes may be affected by peripheral influences, but both of them, in the case of warm-blooded animals, are under the regulatory control of some center or centers in the brain or brain stem. Thus, if the spinal cord is severed in a warm-blooded animal, the thermostatic regulation exercised from above disappears and the homothermic organism becomes poikilothermic. I am not informed whether the brilliant investigations of Dr. Ranson at Northwestern with the Horsley-Clark stereotaxic instrument, by means of which he is exploring various regions in the subthalamic region, have revealed the location in the diencephalon of a thermic center, but that such a center exists is evident from the frequent occurrence of fever after surgical operations on the head and after other injuries to the base of the brain; also the effect of the antipyretics is accounted for by central action. Occasionally, cases are encountered in which hyperthermia follows infectious lesions of the brain, such as those of epidemic encephalitis or poliencephalitis. In such cases the general toxicity of the infecting organism is not such as to be responsible for causing much fever, and yet fever occurs and may persist for months or even years. It is recognized that encephalitis may leave no residues and frequently does not leave the characteristic Parkinson type of residue. We ought to think of the possibility of lasting injuries to thermostatic centers in the brain stem by previously unrecognized encephalitic infection as an explanation at least of some cases of hyperthermia of supposedly normal individuals.

POLIOMYELITIS

PRESENT KNOWLEDGE AND ITS BEARING ON CONTROL

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On Saturday, May 14, 1796, just one hundred and forty years ago today, Dr. Edward Jenner performed his first vaccination against smallpox. It is fitting that we pay tribute on this date to this most successful of measures in specific disease prevention while we are considering the prevention of a disease in some respects similar and in some very different from the disease against which Jenner led the way. The slow development of Jenner's thoughts and work in his campaign may give us heart when we consider the present lack of effective control of poliomyelitis. Neither should we be discouraged if some of our steps are false. Jenner was badly mistaken in more than one regard, and the fierce devotion with which the friends of his procedure fought for every detail of his views has obscured the truth and hindered full prevention. The need for revaccination was combated by Jenner and his direct followers. The credit for setting the world right in this respect cannot be centered on one person, though Goldson in 1804 was probably the first to announce diminution in the protective action of vaccination with time. In 1851, fifty-three years after Jenner's announcement, the National Vaccine Establishment of England declared that revaccination was as incorrect in theory as it was uncalled for in practice. Even the first description of the immediate, or immune, reaction on revaccination, usually credited to Jenner, belongs rather to Jenner's friend James Bryce [1] of Edinburgh, whose careful work on vaccination, first published in 1802, has been pointed out by Dr. George Weaver of Chicago. Bryce also described the accelerated or vaccinoid reaction on revaccination, while Jenner's note was limited to an early reaction after inoculation with smallpox itself.

In connection with today's jennerian anniversary, it might be well to remember that the greatest contribution of this century to the study of vaccination was made by Dr. Clemens Pirquet [2] of Vienna. He simply observed his vaccinations and revaccinations daily until the inflammation had completely subsided, and he recorded them by actual measurement.

Numerically, poliomyelitis is not a large problem in comparison with other infectious diseases. For the last three years for which mortality data are available throughout the registration area, poliomyelitis has accounted for only about 800 deaths a year, "epidemic" encephalitis about 1,000, "nonepidemic" encephalitis about 1,500, tetanus about 1,200, epidemic meningitis about 1,500, tuberculous meningitis about 2,200, other forms of meningitis about 2,100, erysipelas about 2,000, scarlet fever about 2,500, dysentery from 2,000 to 3,000, diphtheria about 5,000, typhoid about 4,300, malaria from 1,500 to 2,500, whooping cough from 4,500 to 7,500, syphilis 11,000, gonorrhea 1,000, tuberculosis about 75,000, and automobile accidents from 28,000 to 36,000.

As to the number of cases, it has been customary to think that for the greater part of the United States there are in round numbers ten paralytic cases a year per hundred thousand of population, counting as paralytic those with definite localized weakness, even though the weakness might be transient and often not reported. This estimate is based on one of the first house-to-house surveys undertaken of an entire community for past illness [3] and on other groups of data, all too small or localized to be very reliable. It is to be hoped that this year's health survey [4] will give a larger body of figures on which a more accurate estimate can be made. In nonepidemic times, reporting is irregular. Except Scandinavia, all of Europe appears to have definitely less of the disease than the United States, and the central part of our own country less than the seaboards. Declared cases are fewer in the warmer belts than in the North. One of the most intense epidemics on record was on the equator, on an isolated volcanic remnant called Nauru or Pleasant Island, 8 square miles in area and holding 2,300 people, 200 miles from the nearest still smaller island 2,500 miles from Sydney, Australia, and 4,000 miles from Hong Kong. There were 700 cases,[5] a rate of 30,000 per hundred thousand, but only a part were paralytic. The natives chiefly were affected, but the Chinese and Europeans who were working for a British phosphate company and had come in contact with the outside world were almost completely spared. In contrast to the usual age distribution of poliomyelitis, only a few patients were under 12 years of age. This epidemic, and a similar tendency toward more intense incidence and occurrence among older age groups in rural epidemics than in cities, form part of the reason for believing that immunization without obvious infection is a valuable prophylactic which is missed by allowing our children to lead too segregated a life in nonepidemic times.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

1. Bryce, James: Practical Observations on the Inoculation of Cowpox, Pointing Out a New Mode of Obtaining and Preserving the Infection and Also a Certain Test of Perfect Vaccination, Edinburgh, 1802; second edition with appendixes, 1809.

2. Pirquet, Clemens: Klinische Studien über Vakzination und vakzinale Allergie, Leipzig and Vienna, Franz Deutike, 1907.

3. Leake, J. P.; Bolten, Joseph, and Smith, H. F.: Winter Outbreak of Poliomyelitis in Elkins, W. Va., Pub. Health Rep. **32**: 1999 (Nov. 30) 1917.

4. The New Health Survey, Government Services, J. A. M. A. **105**: 1127-1128 (Oct. 5) 1935.

5. Müller, A.: Eine epidemisch auftretende Erkrankung des Nervensystem auf Nauru, Arch. f. Schiffs- u. Tropen-Hyg. **14**: 535-543 (No. 17) 1910.

From the spotty fashion in which cases appear even in epidemics, usually without traceable relation to one another or to a credible common source of infection, it becomes almost impossible to formulate a theory consonant with the observed distribution of the disease which does not include carriers as the most important means of spread. If the effective carriers were persistent, it would appear that more frequently a trail would be left through a series of cases pointing with suspicion to one person. In this as in other angles of the disease, we wish that the light were clearer, but we should not desist from acting on the basis of such light as is available.

The marked seasonal wave of poliomyelitis has suggested two modes of spread—by the gastro-intestinal tract, as in some other infections of warm weather, and by insects. The frequency of gastro-intestinal symptoms at onset has also suggested the former mode of spread. Evidence from nature would be hard to secure to refute this, but recent work in various hands with monkey cord virus gives strong support to the idea that the infection is transmitted in nature through the olfactory portion of the nasal mucosa and in fact through the nerve cells themselves. As negative evidence against gastro-intestinal infection the experiments of Clark, Roberts and Preston[6] are persuasive. Susceptible monkeys could not be infected by being fed virus or by having it injected into an isolated intestinal loop, yet the feces of these monkeys were later proved infectious.

The fact that an epidemic of typical intensity, spread and clinical characteristics occurred during a West Virginia winter when observations could eliminate ordinary summer insects as vectors is likewise persuasive that such insects play no necessary part in the spread of poliomyelitis in spite of its usual summer prevalence.

It is generally believed, on the basis of repeated isolation of a filtrable virus from the affected spinal cords in human cases, causing typical symptoms and lesions in monkeys and monkeys only, by intracranial inoculation and particularly by intranasal application, that this ultravirus is the true cause of the disease.

The site of invasion in meningococcic meningitis is believed to be grossly similar to that in poliomyelitis, and both diseases are believed to be spread largely by carriers; yet the one disease is caused by an easily visible invader and the other by an ultravirus. Most infections with ultraviruses are not only intracellular but propagated in the fixed cells of the body. This forms an array for combat different from that presented by a parasite of the surface, the fluids or the wandering cells of the body. It is probable that very minute bodies, in addition to having the power to enter cells, rather than merely entering fluids and intracellular spaces, are taken up very rapidly.[7] It is also possible that immune substances in the body fluids which occur naturally or are stimulated artificially are of less account in actual defense than when the microscopic foe is more visible.[8] Such considerations of special affinity for cells on the part of ultraviruses has led Goodpasture[9] to remark that "it is especially important for investigations to be undertaken in attempts to alter the cellular media by chemical means in the hope of modifying the course of an infection by viruses or of preventing infection completely by rendering normally susceptible cells artificially insusceptible."

To what practical action, then, does this consideration of the disease lead? Obviously against any radical or otherwise disastrous procedures. In spite of the general dread, parents should realize that the numerical chance of affliction is small. Reasonable precautions against needless human contacts during epidemic seasons are wise. So far as a comparison with control individuals pointed, in Los Angeles in 1934, there was no general danger from swimming pools or beaches. A history of overexertion preceding an attack has often been noted in cases of poliomyelitis. That this may be an important hint for prevention is suggested in the Los Angeles epidemic by the fact that with comparable control individuals such a history could be obtained much less frequently than with individuals attacked by the disease.

Full reporting, in this as in every other disease, is the first step in organized control of the situation. In this connection it is strongly advised that physicians, in reporting each case, report it as paralytic or nonparalytic; that is, whether or not any definite local weakness can be detected. Within three days after the first symptoms, most patients who are to be paralytic have given evidence of weakness, and in the others the report can be amended. Every case should be designated as paralytic or nonparalytic. Only in this way can comparison be made from week to week, place to place or season to season. In the 1916 epidemic and preceding it, all but a few reported cases were paralytic. In 1931, 70 per cent of the New York City cases were paralytic, in 1935 about 50 per cent, in Albemarle County, Va., in the same year, about 14 per cent, in Denmark in 1934, 14 per cent, with only 3 per cent in Haderslev County.[10]

In addition to these discrepancies, the recent recognition of conditions similar to nonparalytic poliomyelitis, but of different causation, calls for such differentiation. The Economo type A encephalitis still occurs, as well as the so-called summer encephalitis, or type B. Lymphocytic choriomeningitis, the virus of which was discovered by Armstrong[11] and also found by Rivers[12] and Traub[13] may easily cause confusion. Still more similar to nonparalytic poliomyelitis is the meningoencephalitis, 150 generally mild cases of which occurred last summer within about six weeks in a town of 10,000 in south-central Pennsylvania. Armstrong and Wooley[14] have found this different immunologically from lymphocytic choriomeningitis in that the serums from recovered patients have no protective power against that virus. The possible presence of all these confusing conditions in one locality is reason enough for such differentiation as is practicable. To revert to the jennerian anniversary and Dr. Pirquet's contribution: Pirquet merely observed completely, without prejudice, and recorded from day to day. So by detailed watch of the muscular strength not only is accuracy of diagnosis enhanced in poliomyelitis but treatment is improved and perhaps some day prevention may be achieved. In summary, though undue alarm should be allayed in the prevalence of this

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10. Jensen, Claus: The 1934 Epidemic of Poliomyelitis in Denmark, Proc. Roy. Soc. Med., Sect. Path. **28**: 1014 (June) 1935.
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12. Rivers, T. M., and Scott, T. F. M.: Meningitis in Man Caused by a Filtrable Virus, Science **81**: 439 (May 3) 1935.
13. Traub, Erich: A Filtrable Virus Recovered from White Mice, Science **81**: 298 (March 22) 1935.
14. Armstrong and Wooley: Personal communication to the author.

disease in epidemic intensity, it is reasonable to abstain from unnecessary contacts, even with the well, to guard the especially susceptible ages against excessive strain, and to report suspicious illnesses promptly, but with a differentiation as to whether they are paralytic or nonparalytic. For the present, the prospect of the discovery of a vaccine that will be highly preventive and at the same time relatively harmless is small; and chemical prophylaxis by means of local applications should be considered still in the trial stage.

ABSTRACT OF DISCUSSION

DR. JAMES D. TRASK, New Haven, Conn.: Dr. Leake, in the epidemic on the island of Nauru, was a strain of the virus of poliomyelitis recovered? My experience with poliomyelitis has been gained by following Dr. Leake's footsteps; that is, by making house to house visits in field studies, and this work has been done with Dr. Paul. Our first experience was that it was relatively easy to get the virus from examples of abortive poliomyelitis, provided nasal washings were taken the first two days of the disease. Thus, in 1931 we had two successes out of five attempts. Since then we have tried with vigor, in each epidemic, to detect the virus in nasal washings from all types of patients acutely ill with poliomyelitis and have had only one more success. In the literature there are eleven satisfactory examples of recovery of the virus from patients and three examples of the recovery of the virus from the nose and throat of "healthy carriers"; therefore there is little direct experimental evidence that this disease is actually transmitted by means of direct contact from nose to nose in man. Many people have said that the lack of success in finding the virus, in patients and contacts, is due to the lack of satisfactory methods. This may be the explanation, but the last time we recovered the virus from nasal washings Dr. Paul saved the washings in glycerin, and as late as 100 days from being collected a mere fleck of glycerolated mucus was sufficient to infect monkeys with poliomyelitis. So one can say that in certain instances the method is extremely good and one should question very much whether it is satisfactory to keep on thinking that nose to nose is the method of transmission. It is true for example that, in yellow fever, nose to nose transfer is possible with the virus under laboratory conditions.

DR. SIDNEY D. KRAMER, Brooklyn: Dr. Leake's figures giving the fatalities of the various infectious diseases bring out most clearly the relative importance of these diseases when compared with poliomyelitis and should serve to allay much of the fear of this disease. In order to account for the widespread immunity in the normal population, the widespread dissemination of virus through the agency of healthy carriers has been assumed. This concept was recently supported by the detection of the virus in the tonsils and adenoids of a 2½ year old child who had not been in contact with a case. Immunization in the normal population is therefore apparently accomplished through the so-called subclinical route, much as in diphtheria. Although a number of routes for the entrance of the virus has been suggested, both the experimental and epidemiologic evidence is overwhelmingly in favor of the intranasal route of infection. The ease with which experimental infection can be accomplished by that route in normal animals as opposed to the difficulties in obtaining infection by the gastro-intestinal route tends to support this as the portal of entry of the virus in the natural infection. At present there is no adequate, practical procedure for either preventing or treating the disease. Experiments now in progress seem to hold promise that some procedures for active immunization and passive prophylaxis may be devised. In spite of its relative rareness, it would still be good public health procedure to have some method available for active or passive immunization against poliomyelitis. More recently it has been suggested that the use of certain chemicals sprayed into the nostril may act as a barrier against infection. This work is still in the experimental stage and adequate evidence must yet be presented that such chemicals have in themselves no harmful effects on the nasal mucosa following prolonged use. It should furthermore be realized that the most which can be hoped from such a method of protection is to shift the age distribution of the disease. As far as is known, individuals susceptible to a disease remain susceptible throughout life unless actively immunized against it. In essence the outcome of such transient, nonspecific protection will be to shift the age distribution of poliomyelitis from an urban type in which infection occurs early in life to a rural one in which exposure and infection tend to occur later in life.

DR. PAUL H. HARMON, Chicago: There is some doubt as to whether the epidemic referred to on the island in the Pacific Ocean was truly an epidemic of poliomyelitis, because of the rare and exceptional epidemiologic features involved in that epidemic. Dr. Leake is to be commended for bringing out and urging that poliomyelitis be reported in terms of the three variable types of that disease; namely, the paralytic, the nonparalytic and the abortive type. Only in recent years has convincing evidence come out that the nonparalytic and abortive types far outnumber the really paralytic types, in the proportion of ten to one. This disease should not be minimized because of the fact that in the average epidemic of poliomyelitis the incidence is only 60 to 70 per hundred thousand of population. In the larger epidemics, that of New York in 1916 and in certain Midwest areas in 1917, the incidence reached to from 140 to 160 per hundred thousand, all reported in terms of paralytic cases. Recently it has been the idea that a good many of the so-called sporadic and endemic cases of poliomyelitis are a result of an imbalance between the carrier state and infectiousness of the virus for the individual. There is already some definite evidence to support such an idea, reported by Aycock in the appearance of several instances of poliomyelitis, which followed after a typical incubation period after removal of the tonsils. The appearance of poliomyelitis with a definite incubation period, following overexertion and fatigue, is a common observation. May that not suggest that there are a number of instances of carriers of poliomyelitis in whom the balance between the infection by the virus and the carrier state may not be upset by overexertion or trauma? There is some question as to whether the finding of neutralizing substances in the blood really means immunity to the disease. A certain number of persons who are Schick negative are still susceptible to clinical diphtheria. There is some experimental evidence to support such an idea, which is as follows. The most significant study is the one by Gordon of the University of Chicago, who found that 78 per cent of monkeys that were immune to the disease (possessed antiviral substances) still did not resist intranasal inoculation. From 30 to 40 per cent of individuals who have recovered from clinical poliomyelitis do not have neutralizing substances in their blood, yet is there a person who would not be willing to state that that person is probably immune to reinoculation, if any one was to attempt it? May there not be many strains of poliomyelitis virus producing human infection? Paul and Trask have already studied a few such strains. It is possible that the strains more adapted to the human being produce paralytic cases, while nonparalytic cases may be due to a strain more attenuated than the average. My associates and I were able to isolate from the rectal washings in a nonparalytic case a strain that we had great difficulty adapting to monkeys. As far as we were able to pass it, through three generations, it remained nonparalytic. There is even some experimental evidence to show that serum is of value in protecting individuals passively.

DR. EMIL BOGEN, Olive View, Calif.: Can Dr. Leake give some explanation why the California epidemic in the last few years did not apparently conform to the previous epidemics? Ours was apparently highly communicable, as we could trace the passage of the infection from one case to another in nearly half of the individuals who were reported in Kern County. Incidentally, there were numerous instances in which a paralytic case could be traced to a nonparalytic case, or vice versa, showing that the different types of the disease are not due to different viruses. In the two years over 0.3 per cent were reported as having poliomyelitis in a population of less than 100,000, and there were twenty-five deaths in this double epidemic. In the instances of known contacts in the hospital staff at Los Angeles, or those ferreted out by the epidemiologist in Kern County, nearly 20 per cent of them developed the clinical disease. I wonder whether this is a different virus and whether the individuals there might be expected to show a high incidence of immune bodies against the poliomyelitis virus previously reported but a greater susceptibility to the new virus found there, or whether, owing to the isolation and

the location of the country, it might be expected that we have there, and might have in other parts of the country, large communities which are more susceptible to poliomyelitis and therefore likely to have it again in epidemic form.

DR. J. P. LEAKE, Washington, D. C.: The Nauru epidemic was not reported as an epidemic of infantile paralysis; in fact, Dr. Müller, the German colonial physician who reported it, ruled out infantile paralysis because it was not in infants, for one thing. That was a feature epidemiologically different from our ordinary poliomyelitis. The high incidence is unusual, but it was an unusual place, and a difference from ordinary poliomyelitis could be expected. The other epidemics on what has been called virgin soil have not been as well reported as this: one in Guam, for example, and one in the Bismarck Archipelago. One cannot compare them accurately, but they seem similar. Later observations on Nauru Island have been reported and the patients of the 1910 epidemic are described as having typical residual deformities of poliomyelitis. I believe it is not generally appreciated what a great difference in reporting this disease occurs in different communities, not only depending on the physicians but also according to the concern and knowledge which the parents have and the population generally. The virus was not isolated in Nauru and it was not isolated in the Windber epidemic. Practically the first case in the latter was fatal, and there were no other deaths. Dr. Harmon spoke of the balance or imbalance between the carrier state and infection. I can think of no better reason for the seasonal occurrence of poliomyelitis than that the prolonged warmth of summer after the experience of a winter season makes people more susceptible. Dr. Bogen has asked about the relative susceptibility of different large communities year after year. It is still an unanswered problem.

PERIPHERAL CIRCULATORY DISEASES

EFFECT OF ALTERNATING POSITIVE AND NEGATIVE PRESSURE TREATMENTS ON VENOUS BLOOD AND THE SKIN TEMPERATURES: PRELIMINARY REPORT

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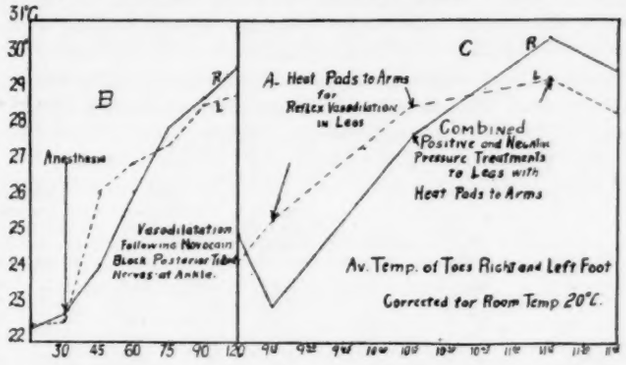
Alternating positive and negative pressure treatments are of definite clinical value in the treatment of peripheral circulatory diseases.[1] Periodic skin temperature readings indicate that the clinical improvement is accompanied by increased circulation. However, the absence of significant elevations of skin temperatures following individual treatments does not substantiate the belief that clinical improvement is due to increased circulation. More consistent and higher elevation in skin temperatures is produced by vasodilatation as a result of local heat or reflex heat. Still these measures are less effective in producing clinical improvement than is seen with pressure treatments. Landis [2] found that 45 C. heat to the arms produces maximum reflex vasodilatation of peripheral vessels in the legs. It is evident that pressure treatments alone do not produce maximum vasodilatation. Combining reflex heat and pressure treatments, our routine procedure gives higher peripheral temperature readings than either measure alone, as shown in the accompanying chart. With



Temperature curves: Senile arteriosclerotic peripheral circulatory disease (table 6). Combined pressure treatments and reflex heat (*C*) produced greater elevation in skin temperatures than could be obtained with maximum vasodilatation due to nerve block (*B*) or reflex heat alone (*A*).

maximum peripheral vasodilatation due to the reflex heat, the additional increase in temperature with the combined procedure must be explained on some basis other than vasodilatation. It is apparent that skin temperatures are insufficient to explain the definite therapeutic value of alternating positive and negative pressure treatments.

Clinical improvement and skin temperature changes do not necessarily imply alterations in blood flow. This is especially true with the insignificant temperature changes that frequently follow pressure treatment. With no change in amount or rapidity of blood flow, increased oxygen-carbon dioxide exchange in the tissues might account, in itself, for some increase in surface temperatures. At the same time the improved tissue metabolism would contribute to clinical improvement. It seemed to us that a study of the oxygen-carbon dioxide content of the venous blood would provide more reliable information to explain the effect of pressure treatments than could be obtained by skin temperatures. By correlating the information thus obtained with the skin temperature readings, a better comparison could be made as to the relative value of pressure treatments, direct heat or indirect heat, or combined reflex vasodilatation and pressure treatment such as we use as a routine.

Consequently this investigation was undertaken to determine, if possible, the effect of heat, pressure treatments or a combination of the two on the peripheral circulation. The following program was carried out on twenty-five patients either as controls or as various types of peripheral circulatory disease:

1. Skin temperature readings under controlled conditions before and after all treatments.

2. Oxygen-carbon dioxide gas analyses of the venous blood of the extremities before and after one hour treatment with (*a*) alternating positive and negative pressure to both lower extremities and 45 C. heat to the upper extremities; (*b*) alternating positive and negative pressure to both lower extremities; (*c*) 45 C. direct heat to both lower extremities or to both upper extremities; (*d*) 45 C. heat to the upper extremity for the reflex effect on the lower extremity.

From the Departments of Surgery and Pathology, Presbyterian Hospital, and the Rush Medical College of the University of Chicago.

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3. Total body metabolism tests and oxygen consumption per minute before and after one hour treatments with alternating positive and negative pressures to both lower extremities and heat to both upper extremities.

PROCEDURE

Skin temperature readings were taken with the Tycos dermotherm.[3] The patients rested in bed for one hour with the lower extremities slightly raised to the level of the heart. This is the position used in giving the pressure treatments. After stabilization at room temperature, one or more skin temperature readings of the toes and feet were taken before and after treatment. All skin temperature readings were corrected for 20 C. room temperature.[4]

Gas analyses of the blood were obtained by Van Slyke's manometric method.[5] The venous blood was obtained as far as possible from the internal saphenous vein or one of its branches in the upper part of the leg and from the same site before and after treatment. The blood was withdrawn under oil, without the use of a tourniquet, and kept in a refrigerator until examined. Analyses were made as quickly as possible after the blood was withdrawn. In a few instances repeated determinations were made on the same patient. When the condition of the veins made withdrawal of the blood difficult or the patient objected to repeated tests, only one or two determinations were made.

Total body metabolism tests were obtained by the Tissot open method[6] (forty-eight tests on fifteen patients), the Haldane gas analysis being used for oxygen-carbon dioxide determinations. No effort was made to obtain basal conditions. However, the patients rested at room temperature for one hour before skin temperatures and metabolism tests were taken. Following one hour pressure treatments to both lower extrem-

TABLE 1.—*Effect of One Hour Positive and Negative Pressure Treatment to the Lower Extremities with 45 C. Heat to Arms on the Oxygen-Carbon Dioxide Content of the Venous Blood and Temperature Changes of the Toes*

			Arms				Legs						
			Oxygen Capacity, Volume per Cent	Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
Diagnosis	Case	Date		Before	After	Before	After	Before	After	Before	After			
Controls	1. Mr. C.	3/26	18.8	75.29	98.9	44.73	38.37	70.9	71.9	44.56	43.27	+6.5 C.	0	1
		4/ 2	17.33	37.9	38.8	47.32	49.46	86.05	89.7	44.6	43.32	+3.4 C.	++	2
	2. Mr. J.	2/27	22.73	75.15	73.6	30.28	32.10	38.4	77.4	27.5	28.65	+2.4 C.	0	1
	3. Mr. S.	4/17	17.27	92.8	82.6	45.06	47.15	....	....	....	.....	+2.0 C.	0	1
Senile arterio-sclerosis	4. Mr. R.	3/ 5	13.19	39.07	93.6	26.09	30.18	58.4	24.26	6.88	7.59	+1.0 C.	++++	18
		3/23	23.36	37.15	98.3	48.77	30.3	48.6	90.0	45.75	34.42	+3.5 C.	++	33
		4/ 8	19.05	26.95	91.7	48.4	40.37	47.65	68.8	45.85	41.8	+3.6 C.	++++	46
	5. Mr. K.	2/20	14.64	19.53	46.4	33.0	25.84	29.37	66.2	22.36	36.81	−0.5 C.	++	1
Diabetic arterio-sclerosis	6. Mr. G.	4/28	27.58	.....	....	.....	.....	35.48	93.8	51.85	36.86	+2.7 C.	++++	18
	7. Mrs. D.	4/29	19.73	.....	....	.....	.....	64.0	99.3	48.95	44.50	+0.8 C.	++++	..
	8. Mrs. D.	4/30	19.2	.....	....	.....	.....	31.38	71.9	52.86	48.51	+0.3 C.	++++	..
Buerger's disease	9. Mr. P.	3/ 7	21.65	54.5	97.4	27.93	25.12	96.6	99.1	22.5	22.3	+1.0 C.	+++	5
		3/17	16.16	.....	....	.....	.....	86.8	88.8	39.95	42.89	+2.2 C.	+	15
		3/30	25.14	.....	....	.....	.....	68.0	88.6	43.05	39.05	−0.8 C.	+++	42
	10. Mr. M.	4/14	21.29	72.6	89.0	45.02	42.52	76.9	94.3	39.2	34.86	+0.4 C.	+	233
	11. Mr. J.	2/27	22.73	75.15	73.6	30.28	32.10	38.4	77.42	27.5	28.65	+1.5 C.	0	152
	12. Mr. C.	3/19	Insufficient blood					Vol. per Cent						
								23.76	21.49	42.07	43.87	+0.3 C.	++	1
	13. Mr. B.	3/16	23.9	44.2	34.0	48.86	48.53	96.5	98.5	39.77	39.03	+1.75 C.	++	..
		4/26	17.54	.....	....	.....	.....	77.26	79.77	43.05	41.92	+0.3 C.	++	..
	14. Mr. R.	2/20	20.38	.....	77.8	.....	18.55	95.8	84.5	37.74	19 65	+3.5 C.	+++	2
		2/25	16.95	76.3	99.1	28.4	21.99	90.8	51.6	20.84	29.11	−2.0 C.	++	6
Neuro-circulatory atrophic arthritis	15. Mrs. G.	3/27	22.26	84.8	98.8	.....	.....	84.8	98.8	34.75	31.63	+4.5 C.	0	6
	16. Mr. B.	3/ 5	21.7	84.0	56.3	20.97	16.98	55.4	80.4	20.2	17.78	+0.75 C.	0	25
	17. Mr. A.	3/16	21.01	81.4	98.3	46.21	43.76	68.8	80.5	43.13	41.53	+2.3 C.	+++	42
	18. Mr. L.	4/ 1	16.33	97.6	37.1	.....	.....	46.35	47.18	50.3	52.1	+2.4 C.	++	22
	19. Mrs. S.	4/21	14.15	.....	....	.....	.....	81.7	37.6	41.3	45.83	+5.6 C.	++	6

TABLE 2.—*Effect of One Hour Alternating Positive and Negative Pressure Treatment on the Oxygen-Carbon Dioxide Content of the Venous Blood of the Legs and Temperature Changes of the Toes*

				Legs						
				Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
Diagnosis	Case	Date	Oxygen Capacity, Volume per Cent	Before	After	Before	After			
Controls	1. Mr. M.	4/16	21.08	67.46	97.1	50.4	44.4	+2.0 C.	0	1
	2. Mr. D.	4/30	18.04	91.15	89.42	47.05	46.3	−0.8 C.	++	2
Senile arteriosclerosis	3. Mr. R.	4/ 7	17.85	82.55	51.9	41.39	45.37	+0.6 C.	0	45
Diabetic arteriosclerosis	4. Mr. G.	4/20	18.71	90.2	86.91	49.38	48.23	+0.3 C.	0	10
	5. Mrs. D.	4/30	18.9	53.5	35.87	45.93	48.6	+0.5 C.	++++	167
Buerger's disease	6. Mr. M.	4/15	20.73	70.8	90.0	47.2	45.2	+0.9 C.	0	236
	7. Mr. B.	4/22	19.26	68.8	76.4	44.31	42.81	+2.7 C.	+	136
	8. Mr. P.	4/27	23.49	89.3	90.54	43.27	41.3	+1.65 C.	+++	79
Neurocirculatory-atrophic arthritis	9. Mrs. S.	4/15	15.2 Insuff. blood	52.55	23.6	48.5	47.8	−0.2 C.	++	10
	10. Mrs. G.	4/20	.....	Vol. per Cent 15.21	14.24	35.91	35.99	+0.7 C.	+	30
	11. Mr. L.	4/21	15.71	70.15	60.27	48.8	44.47	−2.5 C.	0	42

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ities and heat pads (45 C.) to the arms it was possible to determine changes in total consumption of oxygen and elimination of carbon dioxide.

Because of the difficulties in getting patients to cooperate in such an extensive investigation, this preliminary report does not include all types of circulatory diseases. The arthritic patients were selected by Dr. E. E. Irons because of neurocirculatory manifestations. He believed that this group might be benefited by improved peripheral circulation.

RESULTS

Skin temperature readings varied with the form of treatment and the type and severity of the circulatory disease. Pressure treatments alone produced the least significant elevation in skin temperatures (table 2). In this series three patients had decreased readings from 0.2 to 2.5 degrees C. and eight had elevated temperatures from 0.3 to 2.7 degrees C. The majority of these elevations were less than 1 degree C. Heat directly applied to the lower extremities (table 3) or to the upper extremities for reflex vasodilatation (table 4) produced more uniform elevation in skin temperatures. One arteriosclerotic patient with severe diabetes had decreased temperatures after both forms of heat therapy. With direct heat a decline of 1.6 degrees C. was recorded and with reflex vasodilatation 0.6 degree C. All other readings were elevated 1 degree C. or more, direct heat producing a maximum of 2 degrees C. and reflex heat 4.6 degrees C. Combined reflex vasodilatation and pressure treatments produced greater elevation in the temperatures than any other form of treatment. Only three of twenty-six determinations showed decreased readings. These declines were accompanied by considerable perspiration. Generally the most marked elevations in skin temperatures occurred in the absence of perspiration.

Gas analyses of the venous blood was made before and after one hour treatments on twenty-five patients. A total of 287 determinations were made on seventy-three specimens of venous blood.

Under ordinary conditions the character of the venous blood depends on the amount of oxygen absorbed from the arterial blood as it passes through the capillary bed and on the amount of carbon dioxide eliminated into the blood stream. Normally the arterial blood has from 94 to 96 per cent of its hemoglobin saturated with oxygen. Lundsgaard [7] found that in resting subjects the venous blood has an oxygen saturation of from 60 to 85 per cent. The more rapidly the arterial blood passes through the capillary bed, the less oxygen is removed and the less carbon dioxide is absorbed per unit volume of venous blood. Accordingly, as the circulation is increased the oxygen-carbon dioxide content of the venous blood approaches that of the arterial blood. This is accompanied by elevated temperature readings. By immersing the forearms in water at 45 C., Meakins and Davies [8] found that the rate of flow is so accelerated that the oxygen content of the venous blood is practically identical to that of arterial blood. With the flow retarded more oxygen is removed, more carbon dioxide is absorbed, and the temperature decreases.

Local tissue metabolic changes can alter likewise the oxygen-carbon dioxide ratio of the venous blood.

TABLE 3.—*Effect of 45 C. Direct Heat to the Lower Extremities on the Oxygen-Carbon Dioxide Content of the Venous Blood and Temperature Changes of the Toes*

				Arms				Legs						
				Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
Diagnosis	Case	Date	Oxygen Capacity, Volume per Cent	Before	After	Before	After	Before	After	Before	After			
Controls	1. Mr. D.	4/23	17.5	.....	....	.....	.....	75.50	93.5	45.73	44.73	+2.0 C.	+	1
Senile arteriosclerosis	2. Mr. R.	4/13	22.4	38.14	89.0	.....	.....	80.37	91.35	37.1	34.4	+2.1 C.	++++	54
Diabetic arteriosclerosis	3. Mrs. F.	4/28	20.19	.....	....	.....	.....	52.7	89.1	49.89	44.5	+1.2 C.	++++	187
	4. Mr. G.	4/28	16.72	.....	....	.....	.....	94.3	84.73	47.99	49.25	—1.6 C.	0	19
Neurocirculatory-atrophic arthritis	5. Mr. F.	2/27	19.42	.....	....	.....	.....	87.6	94.0	37.64	28.36	+2.0 C.	+++	100

TABLE 4.—*Effect of 45 C. Heat to the Arms on the Oxygen-Carbon Dioxide Content of the Venous Blood of the Lower Extremities and Temperature Changes of Toes*

				Arms				Legs						
				Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
Diagnosis	Case	Date	Oxygen Capacity, Volume per Cent	Before	After	Before	After	Before	After	Before	After			
Senile arteriosclerosis	1. Mr. R.	4/ 6	22.72	41.1	69.2	43.4	37.77	65.2	56.5	39.95	42.1	+3.3 C.	0	43
Diabetic arteriosclerosis	2. Mr. G.	4/23	14.5	....	....	.....	.....	83.45	87.45	47.33	47.83	—0.6 C.	0	21
Buerger's disease	3. Mr. B.	3/12	27.34	37.9	51.5	46.59	41.3	.....	.....	.....	.....	+1.0 C.	0	136
	4. Mr. P.	4/22	25.67	....	....	.....	.....	84.6	97.36	41.79	40.21	+3.6 C.	0	67
Neurocirculatory-atrophic arthritis	5. Mrs. S.	4/ 9	13.6	68.75	93.3	47.00	44.87	61.1	66.5	47.6	44.87	+4.6 C.	+	1

7. Lundsgaard, C.: Studies of Oxygen in Venous Blood: I. Technic and Results on Normal Individuals, J. Biol. Chem. **33**: 133-144 (Jan.) 1918.

8. Meakins, J. C., and Davies, H. W.: Observations on the Gases in Human Arterial and Venous Blood, J. Path. & Bact. **23**: 451 (Dec.) 1920.

Goldschmidt and Light [9] observed that sufficiently intense cold reduces the amount of oxygen removed from the venous blood. They attribute this increased oxygen content of the venous blood to decreased local tissue metabolism. Accordingly the same changes in the oxygen-carbon dioxide content of the venous blood are found with either a rapid blood flow or a lowered tissue metabolism. However, increased circulation as a result of vasodilatation or augmented collateral circulation produces a rise in skin temperatures, while decreased tissue metabolism in all probability is accompanied by lowered temperatures. The reverse situation also can occur. With increased metabolism more oxygen is used and more carbon dioxide is produced. The same oxygen-carbon dioxide changes are found with a retarded flow. Local temperature readings are decreased with a retarded flow and may be elevated with increased metabolism. Consequently changes in the oxygen-carbon dioxide content must be correlated with the skin temperature changes. With these possibilities we were able to interpret the results of this investigation.

Combined pressure treatments and reflex heat were used for twenty-six determinations on seventeen patients (table 1). All but the controls showed marked evidence of peripheral circulatory disease. In twenty of the twenty-six determinations there was increased oxygen content of the venous blood and, in all but one of these, elevated skin temperatures. The one patient with a decline in skin temperature perspired considerably, as did almost all of this series. In most instances a corresponding reduction in the carbon dioxide content was found. These results are in agreement with an increased blood flow.

However, the increased rate of blood flow as interpreted should bear some relation to the increase in peripheral temperatures. This fact could not be correlated with our observations. The first of our control group had only a slight change in oxygen-carbon dioxide content, indicating an insignificant increase in rate of flow. With the recorded 6.5 degrees C. elevation in skin temperatures it is more probable that the increased oxygen content of the more rapidly flowing blood was almost completely offset by an increased consumption of oxygen, owing to greater tissue metabolism. When the examination was repeated five days later a slightly greater oxygen saturation was found with only 3.4 degrees C. elevation in temperature. During the latter treatment considerable perspiration developed, while with the 6.5 degrees C. rise in tem-

TABLE 5.—*Thrombo-Angiitis Obliterans: Comparison of Results of Gas Analyses of the Venous Blood and Peripheral Temperature Changes with Various Forms of Treatment* *

Therapeutic Procedure, Duration: One Hour	Date	Oxygen Capacity, Volume per Cent	Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent		Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
			Before	After	Before	After			
1. Positive and negative pressure treatments to legs and heat to arms	3/ 7	21.65	96.6	99.1	22.5	22.3	+1.0 C.	++++	5
	3/17	16.16	86.8	88.8	39.95	42.89	+2.2 C.	+	15
	3/30	25.14	68.0	88.6	43.05	39.05	−0.8 C.	+++	42
2. Positive and negative pressure treatments only	4/28	23.49	89.3	90.54	43.27	41.3	+1.65 C.	+++	79
3. 45 C. heat to arms only	4/22	25.67	84.6	97.36	41.79	40.21	+3.6 C.	0	67

* This patient, Mr. P., aged 51, had previously had the right leg amputated.

TABLE 6.—*Severe Senile Arteriosclerotic Peripheral Circulatory Disease in Mr. R.: Comparison of Results of Gas Analyses of the Venous Blood and Peripheral Temperature Changes with Various Forms of Treatment*

Therapeutic Procedure, Duration: One Hour	Date	Oxygen Capacity, Volume per Cent	Legs				Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
			Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent				
			Before	After	Before	After			
1. Positive and negative pressure treatments to legs and heat to arms	3/ 5	13.10	58.4	24.26	6.88	7.59	+1.0 C.	++++	18
	3/23	23.36	48.6	90.0	45.75	34.42	+3.5 C.	++	33
	4/ 8	19.03	47.65	68.8	45.85	41.8	+3.6 C.	++++	46
2. Positive and negative pressure treatments only	4/ 7	17.85	82.55	51.9	41.39	45.37	+0.6 C.	0	45
3. 45 C. heat to arms only	4/ 6	22.72	65.2	56.5	39.95	42.1	+3.3 C.	0	43
4. 45 C. direct heat to legs	4/13	22.4	80.37	91.35	37.1	34.4	+2.0 C.	+	54

TABLE 7.—*Severe Diabetic Arteriosclerotic Peripheral Circulatory Disease of the Left Leg: Comparison of Results of Gas Analyses of the Venous Blood and Peripheral Temperature Changes with Various Forms of Treatment* *

Therapeutic Procedure, Duration: One Hour	Date	Oxygen Capacity, Volume per Cent	Legs				Change in Average Skin Temperature of Toes	Perspiration	Total Hours of Treatment
			Oxygen, per Cent of Saturation		Carbon Dioxide, Vol. per Cent				
			Before	After	Before	After			
1. Positive and negative pressure treatments to legs with heat to arms	4/28	27.58	35.48	93.8	51.85	36.86	+2.7 C.	++++	19
2. Positive and negative pressure treatments only	4/20	18.71	90.2	86.91	49.38	48.23	+0.3 C.	0	10
3. 45 C. heat to arms only	4/23	14.5	83.45	87.45	47.33	47.83	−0.6 C.	0	13
4. 45 C. direct heat to legs	4/27	16.72	94.3	84.73	47.99	49.25	−1.6 C.	0	18

* This patient, Mr. G., had previously had his right leg amputated.

9. Goldschmidt, S., and Light, A. B.: The Effect of Local Temperature upon the Peripheral Circulation and Metabolism of the Tissues as Revealed by the Gaseous Content of the Venous Blood, Am. J. Physiol. 73: 146-172 (June) 1925.

perature the limbs remained perfectly dry. The difference between the two temperature readings may be some indication of the effect of perspiration on the peripheral temperatures.

In another control case, more than 100 per cent increase in oxygen content occurred with only 2.4 degrees C. rise in temperatures. Instead of the inverse change the carbon dioxide content was increased. The same condition of increase in both oxygen and carbon dioxide was found also in three patients suffering with severe peripheral circulatory disease. This was due probably to accumulation of carbon dioxide in the tissues as a result of the disease. In five cases of this series the venous blood from the heated arms showed a similar disagreement, one of which occurred both in the arms and in the legs. This was a case of severe arteriosclerotic disease which subsequently, with intensive treatment, had the normal relation in oxygen-carbon dioxide content.

With marked organic occlusion of the peripheral arteries, little change in oxygen-carbon dioxide content followed the initial one hour treatment. Still, almost all the extremities showed some increase in skin temperature. After intensive treatment the changes in oxygen-carbon dioxide content indicated a marked increased rate of flow, but this was not accompanied by any greater increase in skin temperature. In two cases decreased skin temperatures occurred despite oxygen-carbon dioxide changes, indicating markedly increased flow of blood. Both patients had considerable perspiration. It is apparent that skin temperature changes are not entirely reliable and, undoubtedly, perspiration interferes with accurate temperature readings. We believe that higher temperatures would have been recorded if perspiration had not occurred.

Decreased oxygen and increased carbon dioxide content was found in five cases, four of which presented elevated skin temperatures. In one case there was a decline of 2 degrees C., but the entire group perspired. With all patients perspiring and the majority (four out of five) having a rise in skin temperatures, the decline in oxygen content must signify greater oxygen consumption due to tissue metabolism than was compensated for by any increased flow of blood.

Alternating pressure treatments alone produced changes in the oxygen-carbon dioxide ratio and the skin temperatures, which for the most part indicated increased tissue metabolism (table 2). In this series eight of the eleven cases presented elevated skin temperatures, five of which were under 1 degree C. The highest reading, 2.7 degrees C., occurred in a patient who had received 136 hours of treatment. Except in one control and the patients with Buerger's disease all showed reduction in the oxygen content of the blood following treatment. These results do not substantiate the contention that increased circulation follows pressure treatments. At least in the presence of severe circulatory deficiency the results indicate increased utilization of oxygen by the tissues. The minor temperature elevations might be due therefore to the increased metabolism of the tissues treated.

Direct heat was applied to the lower extremities of five patients for its effect on the local circulation (table 3). In four cases there was increased oxygen and decreased carbon dioxide content of the venous blood and increased skin temperature readings of the toes from 1.2 to 2 degrees C. This is completely in accord with our interpretation of increased circulation. One patient with the reverse condition (table 7) is suffering with severe diabetic arteriosclerotic disease of the left leg.

Heat to the arms for reflex vasodilatation in the legs was studied on five patients (table 4). In this series four showed increased skin temperature changes of from 1 to 4.6 degrees C. The same patient who had a decline of 1.6 degrees C. with direct heat had a 0.6 degree C. decline with reflex vasodilatation. Only one patient had a reduction in the oxygen content and increase in the carbon dioxide. With 3.3 degrees C. elevation in skin temperatures there must have been greater utilization of oxygen than was supplied by an increase in circulation.

TABLE 8.—*Total Body Metabolism Rates, Oxygen Absorption, Respiratory Quotient and Peripheral Skin Temperature Changes Following One-Hour Treatments with Alternating Positive and Negative Pressure Treatments to Legs and Heat Pads to Both Arms*

Diagnosis	Case	Date	Basal Metabolic Rate		Percentage Change in Basal Metabolic Rate	Oxygen Absorbed per Minute		Respiratory Quotient		Change in Average Skin Temperature of Toes	Perspiration After Treatment
			Before	After		Before	After	Before	After		
Controls	1. Mr. C.	3/26	+ 6%	+13%	+ 7%	245 cc.	261 cc.	1.04	0.97	+6.5 C.	..
		4/ 2	— 2%	+ 3%	+ 5%	235 cc.	244 cc.	0.75	0.89	+3.4 C.	++
	2. Mr. F. J.	3/19	+26%	+28%	+ 2%	328 cc.	333 cc.	0.77	0.76	+2.4 C.	0
	3. Mr. E.	3/23	+14%	+ 2%	—12%	289 cc.	274 cc.	0.81	0.81	+8.0 C.	++
Peripheral circulation disease—arteriosclerosis	4. Mr. R.	3/ 5	+20%	+24%	+ 4%	261 cc.	267 cc.	0.77	0.82	+1.0 C.	++++
		3/23	+25%	+ 6%	—21%	272 cc.	230 cc.	0.78	0.80	+3.5 C.	++
	5. Mr. K.	2/20	+ 4%	+ 7%	+ 3%	279 cc.	283 cc.	0.68	0.76	—0.5 C.	++
Thrombo-angiitis obliterans	6. Mr. B.	3/12	+12%	+48%	+36%	230 cc.	305 cc.	1.02	0.95	+1.0 C.	0
		3/16	+ 1%	+ 3%	+ 2%	219 cc.	222 cc.	0.78	0.81	+1.0 C.	0
	7. Mr. J. J.	2/27	— 4%	+ 3%	+ 7%	266 cc.	290 cc.	0.79	0.87	+1.5 C.	+
	8. Mr. R.	2/20	+ 3%	+11%	+ 8%	224 cc.	237 cc.	0.79	0.87	—2.0 C.	++
		3/12	+20%	+ 8%	—12%	248 cc.	219 cc.	0.92	1.01	+2.7 C.	++++
	9. Mr. C.	3/19	+16%	+20%	+ 4%	273 cc.	284 cc.	0.85	0.82	+0.3 C.	++
	10. Mr. P.	3/19	+23%	+10%	—13%	330 cc.	295 cc.	0.92	0.93	+2.2 C.	+
		3/30	+ 5%	+15%	+10%	293 cc.	321 cc.	0.79	0.80	+0.8 C.	+++
	11. Mr. B.	3/16	+56%	+32%	—24%	427 cc.	366 cc.	0.76	0.74	+1.75 C.	++
		3/19	+47%	+31%	—16%	410 cc.	361 cc.	0.75	0.78	+1.25 C.	+
Neurocirculatory-atrophic arthritis	12. Mr. F.	2/24	+25%	+34%	+ 9%	289 cc.	311 cc.	0.81	0.78	+3.75 C.	+++
	13. Mr. A.	3/ 2	+12%	+ 7%	— 5%	272 cc.	263 cc.	0.80	0.74	+3.5 C.	++
		3/16	+ 7%	0	— 7%	259 cc.	244 cc.	0.84	0.80	+2.3 C.	..
	14. Mr. L.	3/23	+ 7%	+16%	+ 9%	221 cc.	235 cc.	0.77	0.79	.....	..
		3/26	+ 6%	+10%	+ 4%	218 cc.	278 cc.	0.79	0.76	.....	..
		4/ 2	+ 1%	+ 3%	+ 2%	206 cc.	210 cc.	0.79	0.80	.....	..
	15. Mr. B.	3/ 5	+13%	+24%	+11%	319 cc.	354 cc.	0.81	0.79	+0.75 C.	0

Judging from the results of gas analyses of the venous blood and temperature readings, reflex heat is more effective in producing increased circulation than direct heat or pressure treatments. However, pressure treatments produced more significant evidence of increased utilization of oxygen by the tissues. Reflex heat and pressure treatments combined produced not only the highest elevations in skin temperature but also the most marked changes in the oxygen-carbon dioxide content of the venous blood.

Total body metabolism tests were made on twenty-four patients before and after our routine form of pressure treatments (table 8). Slight changes in total oxygen consumption and total carbon dioxide elimination had no apparent relation to the changes in skin temperature readings. Sixteen showed increased oxygen consumption and eight decreased. Because of the normal factors of error in metabolic determinations, these results do not appear significant. However, in view of the general body relaxation and rest (frequently sleep and relief from pain) during the treatments a lowered oxygen absorption rate could have been expected. The elevated skin temperatures, at least in part, could be the result of increased local tissue metabolism. There is no increase in mouth temperature.

COMMENT

Increased circulation of blood does not explain the clinical improvement that follows treatment of peripheral circulatory diseases with alternating positive and negative pressure. Other therapeutic measures, more effective in increasing peripheral circulation, as determined by elevated skin temperatures, are of definitely less clinical value. On the other hand, Barker,[10] Schwartzman,[11] Frey [12] and others have used tissue extracts with successful clinical results in spite of the absence of demonstrable increased circulation. Nevertheless Landis,[1] Herrmann,[1] Allen and Brown,[13] de Takáts,[14] Conway [15] and Shipley and Yeager [16] attribute the beneficial results of pressure treatments to increased circulation of blood. Herrmann [1] recently has mentioned that some value of positive and negative pressure treatments might be in improved local tissue metabolism. We believe there is little doubt that improving the circulation in the extremities, especially in the presence of circulatory disturbances, simultaneously influences the oxygen consumption of the tissues. However, our results seem to indicate that alternating pressure treatments primarily effect the oxygen-carbon dioxide exchange in the tissues regardless of whether or not increased circulation occurred.

Barcroft [17] distinguishes between anoxia, which means oxygen want, and anoxemia, oxygen deficit in the blood. In the large majority of patients with peripheral circulatory disease there is no oxygen deficit in the arterial blood. However, at least in the most severe cases of circulatory deficiency the tissues seem to be unable to utilize the available oxygen supply—an anoxia. According to Peters and van Slyke,[18] the physiologic effect of anoxia is "directly attributable to diminished oxygen tension in the tissues."

Oxygen is carried in the blood by the hemoglobin, an efficient arrangement for increasing the oxygen carrying capacity of the blood. The gaseous exchange in the lungs and tissues is on a physical basis, passing from the regions of higher concentration to those of lower. This is in accordance with the laws of diffusing gases. Elimination of carbon dioxide from the tissues and blood is by the same process. The oxygen in the air which is brought in contact with the blood in the alveoli passes from the place of higher to lower tension. In this way the blood absorbs oxygen to the extent, normally, of 20.9 volumes per cent. From the blood the oxygen then passes to the tissues because of lower oxygen tension. Similarly the carbon dioxide accumulating in the tissues is under greater pressure than is that in the blood. Accordingly the blood absorbs carbon dioxide and carries it to the lungs, where it is expelled because of the still lessened carbon dioxide pressure in the air.

The changes in environmental pressures as a result of pressure treatments seem to be less likely to increase the flow of blood, especially in organic blood vessel disease, than it is to change the oxygen-carbon dioxide tension in the tissues. These changes in tension would effect the diffusion of oxygen from the blood to the tissues and carbon dioxide from the tissues to the blood. In other words, improved local tissue metabolism follows such pressure changes. Less elevation in skin temperatures is produced by this oxidation process than by increasing the flow of blood. The results of this investigation indicate that this actually takes place during treatments with alternating positive and negative pressure.

Since most peripheral circulatory diseases have some vasoconstriction element,[19] heat applied to the arms is an efficient means of producing reflexly maximum vasodilatation in the lower extremities. Therefore the additional elevation in skin temperatures which follow combined pressure treatment and reflex heat indicates that the therapeutic effect of pressure treatments is not due to vasodilatation. Both Herrmann and Landis have suggested recently that some form of heat be used in conjunction with pressure treatments. The results herewith reported provide an adequate explanation for the superiority of the combined form of treatment. Reflex heat produces maximum vasodilatation with an increased circulation, while pressure treatments increase tissue metabolism. In our experience this procedure is the most effective means of relieving the pathologic changes in the tissues due to deficient circulation.

The respiratory function of the skin itself may be an important factor in the clinical improvement that follows pressure treatments. The cutaneous surface is capable of absorbing oxygen from the air and eliminating carbon dioxide. Shaw and Messer [20] inferred from the results of their investigation that gases continually pass in and out of the blood by diffusion through the skin. Under ordinary conditions the average amount

10. Barker, N. W.; Brown, G. E., and Roth, Grace M.: Effect of Tissue Extracts on Muscle Pains of Ischemic Origin (Intermittent Claudication), Am. J. M. Sc. **189**: 36-43 (Jan.) 1935.
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13. Allen, E. V., and Brown, G. E.: Intermittent Pressure and Suction in Treatment of Chronic Occlusive Arterial Disease, J. A. M. A. **105**: 2029-2034 (Dec. 21) 1935.
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16. Shipley, A. M., and Yeager, G. H.: Passive Vascular Exercises in the Treatment of Peripheral Circulatory Disease, Surg., Gynec. & Obst. **59**: 480-485 (Sept.) 1934.
17. Barcroft, J.: Anoxemia, Lancet **2**: 485 (Sept. 4) 1920.
18. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Analysis: Interpretations, Baltimore, Williams and Wilkins Company, 1931, vol. 1.
19. Brown, G. E.: The Treatment of Peripheral Vascular Disturbances of the Extremities, J. A. M. A. **87**: 379 (Aug. 7) 1926.
20. Shaw, L. H., and Messer, Anne C.: Cutaneous Respiration in Man: III. The Permeability of the Skin to Carbon Dioxide and Oxygen as Affected by Altering Their Tension in the Air Surrounding the Skin, Am. J. Physiol. **98**: 93-101 (Aug.) 1931.

of oxygen absorbed by the skin corresponds to one one-hundredth of the amount absorbed by the lungs.[21] The amount of oxygen that can be absorbed was found to vary according to the temperature and concentration of the gas. With a constant oxygen tension in the blood, the rate of oxygen absorbed from the air will vary directly with its oxygen tension. Consequently the alternating pressure treatments in changing the oxygen-carbon dioxide tension in the air should influence the respiratory function of the skin. The few irregularities in our results in the oxygen-carbon dioxide content of the blood following pressure treatments might be due to this factor.

Neurocirculatory disturbances are frequently associated with atrophic arthritis. Local treatment for arthritis is directed usually to increasing the circulation. For the same reason Rowntree and Adson [22] perform sympathectomies with some encouraging improvement in the arthritic condition. The increased circulation that follows this surgical procedure relieves the neurocirculatory symptoms, but White [23] reports that in his experience there is little change in the course of the arthritis.

The fact that our routine procedure of reflex vasodilation and pressure treatments has given such good clinical results in peripheral circulatory diseases suggested its use in atrophic arthritis associated with neurocirculatory disturbances. The increased circulation would relieve the symptoms due to the circulatory deficiency, and the improved local tissue metabolism as a direct result of the pressure treatments might be beneficial to the arthritis. Accordingly Dr. E. E. Irons and Dr. E. M. Barton selected a group of cases which most closely met the requirements of Rowntree and Adson [24] for sympathectomies. Their clinical results will be reported separately.

SUMMARY

The purpose of therapeutic procedures for peripheral circulatory disease is to promote increased circulation of blood in the extremities. These procedures include hot applications, contrast baths, diathermy, baking, exercises, massage, nonspecific vaccines and, most recently, alternating positive and negative pressure. Although these measures are extensively used, little definite information is available as to their relative value. Increased skin temperature readings are of some help in estimating the extent of improved circulation. This is particularly so following sympathectomy in selected cases of vasospastic disease. In the absence of definite elevations in skin temperatures, clinical observations alone have been relied on in determining the success of the therapeutic measures. The results of this investigation indicate that the beneficial effects of pressure treatments is on a physiologic basis of increased tissue metabolism.

The addition of reflex heat to the pressure treatments has given the best clinical results. The heat produces increased blood flow as a result of maximum vasodilatation and the pressure treatments increase the exchange of oxygen-carbon dioxide in the tissues. Since the natural course of most peripheral arterial diseases is progressive, no estimate can be made as to the permanent effect of the pressure treatments. The improvement in peripheral circulation must be kept in advance of the disease process. Gas analyses for the oxygen-carbon dioxide exchange in the tissues and peripheral temperature readings are of value in determining how frequent and how intensive the treatments should be.

Except for the controls and the patients with arthritic neurocirculatory disease, the other patients had severe organic occlusive disease. In some of the latter cases, preliminary nerve block [25] was done with procaine hydrochloride to establish the fact that our routine combined form of treatment could produce greater elevation in skin temperatures than occurred with maximum vasodilatation. Although the results herewith reported are concerned with one hour treatments, subsequent periodic determinations can be accepted as the cumulative effect of the treatments. As an index to the cumulative effect, the total number of hour treatments is given in the tables.

The respiratory function of the skin may be an important factor in the success of pressure treatments. It is interesting that the cutaneous surface is capable of absorbing oxygen from the air and eliminating carbon dioxide. With organic arterial occlusion the skin is usually dry and atrophic. Reid [26] has emphasized the need of proper care in cleansing and greasing the skin. Keeping the skin soft and pliable probably aids the cutaneous surface in absorbing oxygen from the air and eliminating carbon dioxide into the air. With this in mind the care of the skin should be an important part of the routine care of the extremities in peripheral circulatory disease.

Although the results of the total metabolism tests indicate some increase in oxygen consumption following our routine form of treatment, they are used only as possible corroborative evidence for our other observations. The factors of error in determining metabolic rates are too great to permit accepting these metabolic readings alone as conclusive evidence of increased oxygen consumption following treatments with alternating positive and negative pressure.

CONCLUSIONS

Correlating the results of gas analyses for the oxygen-carbon dioxide content in the venous blood of the extremities before and after positive and negative pressure treatments with the elevations in skin temperatures has provided a physiologic basis for treating peripheral circulatory diseases with alternating changes in environmental pressures.

Alternating positive and negative pressure treatments primarily effect the oxygen-carbon dioxide exchange in the tissues. This oxidation process may account for the increased skin temperatures. There is little evidence that circulation is increased, especially in the presence of organic occlusive disease.

Vasodilatation as a result of direct heat or reflex heat is more effective in increasing peripheral circulation but apparently has little effect in augmenting oxygen-carbon dioxide exchange in the tissues. The increased circulation merely increases the adequate oxygen supply that is still available.

Combining reflex vasodilatation with pressure treatments, our routine procedure is of distinctly more

21. Shaw, L. H.; Messer, Anne C., and Weiss, Soma: Cutaneous Respiration in Man: I. Factor Affecting Rate of Carbon Dioxide Elimination and Oxygen Absorption, Am. J. Physiol. **90:** 107-118 (Sept.) 1929.

22. Rowntree, L. G., and Adson, A. W.: Bilateral Lumbar Sympathetic Ganglionectomy and Ramisectomy for Polyarthritis of the Lower Extremities, J. A. M. A. **88:** 694-696 (March 5) 1927.

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25. Scott, W. J. M., and Morton, J. J.: The Differentiation of Peripheral Arterial Spasm and Occlusion in Ambulatory Patients, J. A. M. A. **97:** 1212-1215 (Oct. 24) 1931.

26. Reid, M. R.: The General Care of Peripheral Vascular Diseases, Ann. Surg. **96:** 733-743 (Oct.) 1932.

clinical value than either measure alone. The reflex vasodilatation produces maximum increase in circulation and the pressure treatments augment local tissue metabolism. The resulting greater utilization of increased oxygen supply seems to be the basis for the superiority of this form of combined treatment.

The permanence of the improved circulation and local tissue metabolism cannot be determined because of the natural progress of most peripheral circulatory diseases. It is advisable to keep the improvement in circulation in advance of the disease process.

55 East Washington Street.

THE MASSIVE BONE GRAFT IN UNUNITED FRACTURES

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The problem of the ununited fracture is one that I brought before the Section on Orthopedic Surgery in 1921, reporting 247 ununited fractures, and again in 1923, discussing the treatment of 220 patients who had fractures in a fixed state of nonunion; both of these series of cases were encountered at the Mayo Clinic. Basing this paper on material encountered in the same institution, I venture to discuss again the treatment of ununited fractures and am reporting the results in treatment of 336 traced patients of a total of 374 who have been operated on since my last report. My reason for this presentation is that at the clinic with increased experience we have evolved a comparatively simple technic that gives a higher percentage of good results than we have heretofore obtained. Experience has taught us that the larger the graft, the better the chances of success. We have termed this type of graft the "massive graft." Campbell uses the same type of graft and calls it the "onlay graft." It might well be designated as the "massive, onlay autogenous graft." Some of our patients had more than one ununited fracture; thus the 374 patients had a total of 413 ununited fractures. There were 288 males and eighty-six females, whose average age was 33½ years.

The order of frequency with which the various bones were sites of ununited fractures was as follows: 1. The tibia was involved in 132 instances and the site of fracture was the upper third in twelve, the middle third in sixty-five and the lower third in fifty-five. 2. The radius was involved in seventy-nine instances; the fracture was in the upper third in three, in the middle third in thirty-two and in the lower third in forty-four. 3. The involved bone was the humerus in seventy-four instances; the site of fracture was the upper third in nine, the middle third in thirty-three and the lower third in thirty-two. 4. The femur was involved in sixty-eight instances and the site of fracture was the neck in thirty-seven, the upper third in seven, the middle third in sixteen, and the lower third in eight. 5. Fifty of the ununited fractures affected the ulna; the site of fracture was the upper third in thirteen instances, the middle third in twenty-four and the lower third in thirteen. The ununited fractures were of other bones in ten instances.

Two hundred and fifty-four of the total number of patients had initially simple fractures and 120 had compound fractures, but 215 of the patients had fractures associated with severe contusing, twisting or crushing types of accidents, which emphasizes the fact that a large percentage of ununited fractures are associated with severe injury. Two hundred and four patients of the total number of 374 had been operated on previous to their visits to the clinic, some three or four times or more, and in operations on 100 of the patients some form of metal, such as plates, bands or wires, had been used for internal fixation. Fifty-five patients had been submitted to autogenous bone grafting operations elsewhere but roentgenograms disclosed that in the majority of these cases the graft had been very small and did not approach fulfilment of the massive graft. A considerable number of these grafts had been inserted in the presence of a draining sinus.

As has been stated, in some cases we treated more than one ununited fracture by transplantation of bone and in a few cases we inserted second bone grafts because of failure of the first. Among the 336 traced patients, 367 fractures were subjected to bone grafting operations. Calculating the results on the basis of traced patients, there were fifty-two failures and 284 successful results, or 84.5 per cent of the patients obtained bony union. Calculated on a basis of the number of fractures treated, the percentage of success is practically the same; the fractures of both bones of the forearms were those which chiefly increased the number of operations over the number of patients. The results in the traced cases, according to the bones fractured, were as follows: tibia, 118 with ninety-six bony unions, or 81 per cent; the radius alone, forty-six with forty-one bony unions, or 89 per cent; the humerus, sixty-three with fifty-five bony unions, or 87 per cent; the femoral neck (intracapsular), thirty-three with twenty-five bony unions, or 76 per cent; the femoral shaft, twenty-five with twenty bony unions, or 80 per cent; the radius and ulna together, twenty-three with twenty bony unions, or 87 per cent; and the ulna alone, seventeen with fourteen bony unions, or 82 per cent. Obviously the twenty-three instances in which the radius and ulna both were sites of ununited fracture must be thought of as representing twice twenty-three bones if all bones fractured are to be counted in the total.

TYPES OF BONE GRAFT

The intramedullary graft must be mentioned but not for approval. It is still used occasionally, particularly for fractures of the shaft of the femur that are delayed in uniting, but it is not suitable for the typical case of nonunion. It is a foreign body in the medullary canal, has no physiologic action and provides only fair fixation.

The osteoperiosteal graft is perhaps best suited for use in treatment of children. Osteoperiosteal grafts give no support and we have not been satisfied with results from their use.

The inlay method of Albee is characterized by precision and accuracy in fitting the bone graft (fig. 1 *a*). Its most useful field is in treatment of fractures of the tibia where exposure is easy, but in dealing with small bones, such as the radius and ulna, and with the deeply placed femur, only a few surgeons are capable of the meticulous technic necessary.

The massive graft, which is applied and firmly held to a broad, well prepared area on each fragment, has been, in our hands, the most successful (fig. 1 *b*).

One distinctive advantage of the inlay and the massive onlay graft is that they provide good fixation.

From the Section on Orthopedic Surgery, the Mayo Clinic.
Read before the Section on Orthopedic Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

However, because considerable absorption takes place before any bone graft is vascularized and revitalized, a period of weakness develops. Therefore adequate external fixation, preferably by plaster casts, must be provided until union has become complete. Disregard of this leads to undue strain on the graft and in the period of weakness it will generally fracture.

The larger the graft the more strength it has in this period of weakness, during which revitalization takes place. Thus experience has taught that, other things being equal, the larger the graft, the better the chance for success. It is because of this fact that I wish to stress the term "massive" and to urge that it be retained in speaking of this type of bone graft, thus emphasizing the fact that bone grafts should be as large as possible.

A discussion of the physiology of repair of bone is not within the scope of this paper. The part played by the periosteum has been written about extensively and, although the periosteum should be retained if possible, clinically we have never been convinced that it was of any great importance. It is well to take the bone graft from as near the epiphyseal region as possible, for it is in that area that the bone cells are the most active physiologically and, as I shall later stress in discussing the technic, the small pieces of spongy bone obtainable close to the epiphyseal line are very important, a fact not generally appreciated.

SELECTION OF CASES

One of the outstanding causes of failure is postoperative infection. The percentage of cases in which infection follows operation, if infection is not previously present and if the field of operation is free of scar tissue, is no higher than in other types of surgery. A good number of the total number of patients, 204, as has been said, had been operated on before coming to the clinic and they had varying degrees of scar tissue. In eighty-one of the traced cases infection had taken place, either at the time of accident or at the operation performed before the patients came under our care and, although healing had taken place by the time of our operation, in twenty-two cases, or 27 per cent of cases in which infection once had been present, infection developed after our operation. Of 255 cases in which infection had not taken place, either at the time of accident or at previous operations, in thirty, or 11 per cent, infection developed. This percentage of infection may be higher than that encountered in the usual run of clean surgical cases, but it must be remembered that many of these patients had extensive scarring, both in the skin and in the deeper structures, attributable either to the injury or to previous operations. It was necessary to expose the fragments through this nonvascular scar tissue and the trauma necessarily incident to the operation produced a field that easily became infected. Even if frank infection does not develop after operation, scar tissue of the fascial planes or of the skin may undergo necrosis and, as these tissues break down, the semiliquid, degenerating mass occasionally becomes infected from the blood stream. We have had no deaths from infection nor have we been forced to amputate for infection in any of this series of cases. There was only one death and that was attributable to a cerebral embolus finding its way through a patent foramen ovale in the heart of a woman who had been subjected to a bone grafting operation for ununited fracture of the neck of the femur. Death occurred on the fourth day after operation.

Sinuses must be healed and all redness and swelling must have disappeared for many months before repair of an ununited fracture is attempted. We have come to insist on at least six months having elapsed between the disappearance of these signs and the time selected for operation. Infection occurring in a wound after transplantation of bone usually means failure.

MASSIVE GRAFT

Our percentage of successful bone grafts has increased, I believe because we have become more judicial than we formerly were in selection of the time to operate, because we use the massive graft and because we have improved the actual technic of placing the graft.

The patient's general health, of course, should be investigated, but patients who have ununited fractures, taken as a group, are of the healthy, robust type. The cause of failure of a fracture to unite is a local one in most cases, but in this paper I cannot discuss this interesting phase of the subject. Syphilis, in our experience, has not been a factor. If the patient had syphilis we treated for this disease until the blood was negative and then proceeded with our surgical work.

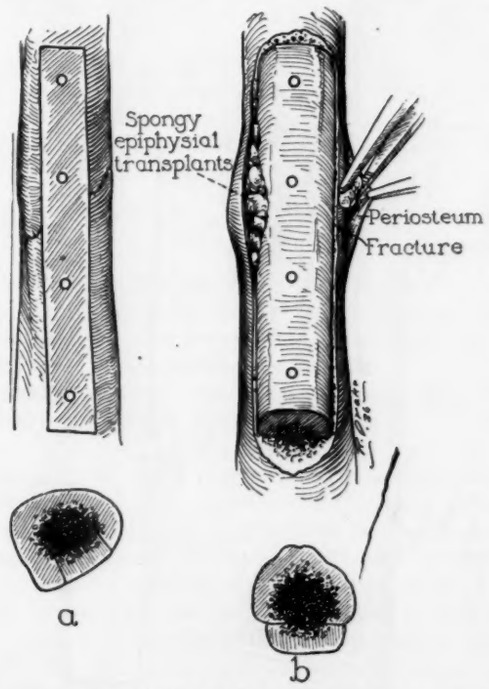

Fig. 1.—*a*, inlay, graft held by beef bone screws; *b*, massive graft held by beef bone screws. Note greater amount of bone, also multiple spongy bone transplants at line of fracture.

PREPARATION OF FRACTURE SITE

The extremity should be shaved if necessary and any of the recognized ways of rendering the skin sterile may be used. A tourniquet should be used unless its use is contraindicated for some reason.

TECHNIC

The incision should be adequate to allow exposure of the fracture and sufficient of the fragments so that the massive graft can be applied. The skin should be draped carefully with towels.

Dissection down to the bone should be carried out with the least possible trauma and without unnecessary stripping back of the periosteum and tissues surrounding the bone. This is extremely important if the fracture has been compound or if previous operations

have been performed, for rough handling of scar tissue may lead to gangrene and slough. The ends of bone should be exposed, the fibrous tissue removed from between them, the rounded ends reshaped, the medullary cavities opened and the ends of the bones fitted together, even at the expense of shortening. Shortening of a leg by 1 inch (2.5 cm.) can be easily compensated for.

The cortices of the fragments where the graft is to be applied should be freshened by aid of the chisel. We have come to believe that the use of a sharp chisel is preferable to the saw, for the slightly irregular surface produced by the chisel is more conducive to a take of the graft than is the smooth, ground surface left by the circular saw. The outer layer of the cortex should

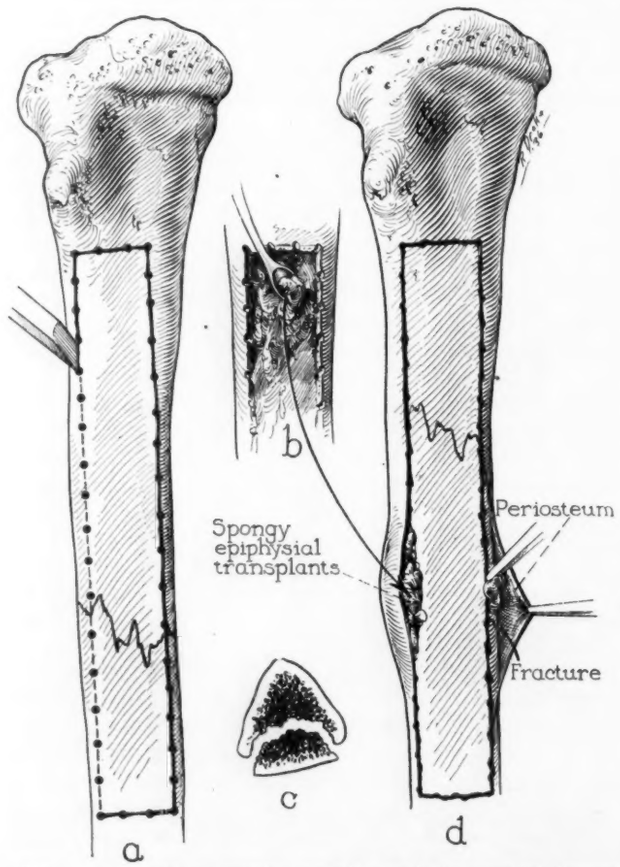

Fig. 2.—*a*, removal of massive reversible graft for ununited fracture of tibia by aid of chisel and drill holes; *b*, removal of spongy epiphyseal transplants from upper end of bone; *c*, cross section showing large graft obtainable from tibia, and *d*, reversible massive graft in position with multiple spongy graft about site of fracture.

be chiseled away until the deeper, vascular tissue bleeds. This preparation should extend well beyond the line of fracture into the healthy bone of each fragment, the distance varying with the bone involved. For the humerus the graft should be at least 10 cm. long and slightly longer for the femur. While bone for the graft is being obtained the wound should be filled with a saline pack and the skin drawn snugly together with skin clips to control oozing, for the tourniquet should be removed at this stage.

Removal of Bone Graft.—If a second surgical team is available to remove bone for the graft, the time will be materially shortened. The graft should be removed from the flat internal surface of the tibia as near the upper epiphyseal region as possible. The graft can be taken out with a motor saw or by drilling multiple holes and then chiseling between them (fig. 2 *a*). In operating on an adult it is possible, with a good sized curet, to remove spongy bone contiguous to the upper epiphyseal line (fig. 2 *b*). These scrapings are of the greatest aid and should be kept warm and moist in a saline pack. The rough medullary portion of the bone graft is removed with bone biters until the deep cortical layer is reached. This material is saved, along with the other scrapings of spongy bone. The wound in the leg should be closed immediately and bandaged.

Application of Massive Graft.—The wound at the site of fracture is opened, the fragments are held firmly together, and the flattened, medullary side of the bone graft is placed against the prepared areas on the cortices and held firmly in this position with bone holders. A drill is then put through the bone graft, through the proximal cortex, across the medullary cavity and through the opposite cortex. Then a tap [1] of the same size is put in to steady the bone graft, and this process is repeated so that the four taps are left protruding in each fragment. This steadies the fragments and the bone graft, and the surgeon can then tell whether the position is satisfactory. If it is, one tap is removed and a beef bone screw of corresponding size is inserted. This is repeated for each drill hole, securely holding the fragments in position. The large tops of the screws are bitten off with a bone biter.

The next step is almost as important as the use of the graft. The bone graft steadies the fragments, it is true, but the scrapings that are saved to be packed around the site of fracture and along the margins of contact of the bone graft with the fragments, near the line of fracture, furnish great physiologic stimulation and help in causing the fragments and graft to unite rapidly. This insures a large amount of spongy bone near the fractured ends, which are sluggish physiologically and need this stimulation. The wound is then closed and a plaster-of-paris cast is applied, to be worn until union is complete. If there is considerable oozing and soiling of the cast, it can be removed at the end of three or four weeks and a new one applied.

SUMMARY

A review of the records of 374 patients who had ununited fractures discloses that 413 fractures were treated. Some patients had more than one ununited fracture; for example, both radius and ulna.

Three hundred and thirty-six patients were observed long enough for us to be certain as to the result. Two hundred and eighty-four, or 84.5 per cent, obtained bony union. Among the traced patients were 367 fractures which were subjected to bone grafting, and the results when calculated according to the number of operations was practically the same as when reckoned according to the number of patients.

The "massive" graft, the same type as that which Campbell calls the "onlay graft," is our choice. The secure fixation with accurate fit and the packing about the site of fracture of scrapings of spongy bone obtained from near the epiphyseal line are necessary steps in the operation.

ABSTRACT OF DISCUSSION

DR. OSCAR L. MILLER, Charlotte, N. C.: Massive bone transplants or implants are primarily indicated for bridging defects in long bone or for mobilization of joints. Defects in bone may be seen as extensive shaft bone substance or neglect, frank nonunion, at some point along the shaft. While the massive bone graft operation is carried out for the purpose of stimu-

1. We use either a standard 6/32 or 10/24 Standard American Machine screw tap, according to the size of the drill used.

lating new bone growth, such a graft should generally be so implanted as to act at the same time as an internal fixation splint to the affected parts. In spite of how secure, though, the internal fixation of the implant may appear to be, further external fixation measures are indicated. The best types of bone graft appear to be the massive onlay grafts in the hands of surgeons equipped to make up the autogenous elements necessary, and the wedge-in implant. My experience has been largely with the latter, where long bone defects have been encountered. When using the wedge-in bone grafts, one may carry to the defect quite a lot of medullary bone along with the cortical mass, and also give positive pressure between the defective bony ends. There appear to be indications for two main types of massive grafts, the onlay and the wedge-in, and both should be transplanted with a view to bone regeneration and, at least temporarily, internal splinting for fixation. I have had some experience with failure in using massive bone grafts to bridge defects of the tibia, particularly when repeated operations have been carried out through the tissues of the shin. Twice I have been able to succeed with such a graft by exposing the posterior surface of the tibia and transplanting to that aspect of the bone where both the soft and bone tissues had not been traumatized.

DR. FREMONT A. CHANDLER, Chicago: The large series of cases that Dr. Henderson has had is remarkable, when one thinks of the traumatic surgery that has been done in these cases and that more than 200 of the patients had been operated on from one to seven or eight times before he received them for treatment. It shows the failure of much of our bone surgery. When placed in proper hands, the results may be satisfactory after so many failures. It is interesting also to note the high percentage of nonunions associated with foreign material fixation, especially the metals, plates and wires. In view of the extensive surgery done previously in these cases, with the scar tissue harboring potential infection, his percentage of 24 per cent infections seems low. One point that has not been touched on is the function of the bone graft. The function of bone is the withstanding of pressure. A bone transplanted into soft muscular tissue will absorb, whereas bone subjected to some end pressure will survive. So, in placing a bone graft, I like to have some end strain; but, as Dr. Henderson has mentioned, I try to avoid the torsion and cross strains that would result in fracture. Another point in his paper that was illuminating is the high percentage of nonunions in the upper third of the tibia rather than in the ordinarily more popular area of the lower third. I think the general conception is that the nonunions are more frequent in the lower third. His paper emphasizes the upper third rather than the lower third. This presentation also completes the symposium on fractures of the neck of the femur, and I see that a large number of the nonunions that were being worried about two days ago may be solidified by massive bone grafts.

DR. W. K. WEST, Oklahoma City: My experience in the use of massive autogenous bone grafts has been limited to the modified Campbell technic, which is slightly different from the method described by Dr. Henderson. The principal difference is that the onlay graft is held in position by autogenous bone pegs. Anatomically, the most difficult area for successful bone grafts is the upper humerus and upper radius. Onlay grafts are best suited to the humerus, ulna and radius. In the tibia I prefer the inlay and in the femur the intramedullary autogenous bone peg. Where metal fixation has been previously attempted, such as the use of Lane plates, Parham bands or wire, it is better to remove the foreign bodies as a preliminary operation to the massive bone grafting. Great care is necessary in obtaining mechanical efficiency in cases in which there is marked bone atrophy. In those cases of fracture of the upper humerus it is best to drive the upper end of the graft into the cancellous portion of the head, as it is impossible to obtain fixation in atrophic cancellous bone. This operation calls for two teams experienced in bone surgery. Old compound fractures must not be operated on sooner than one year after the cessation of drainage. Adequate external fixation is most essential and should be maintained for many weeks until such a time as the roentgenogram shows adequate bony union.

DR. MELVIN S. HENDERSON, Rochester, Minn.: I didn't show lantern slides of cases that I had operated on for the reason that I wanted to confine the discussion to the essential fundamentals of technic. I would like to emphasize again that the bone grafts should be large and that the fragments should be well prepared and freshened for the reception of the bone graft. The graft should be smoothed down on the medullary surface so that the deep layer of cancellous bone is exposed, and it should fit snugly to the fragments. The grafts should then be held firmly in place either by beef-bone screws or by autogenous pegs; if the fragments are very osteoporotic, Parham bands may be used. Firm fixation must be obtained. Around the fracture line and along the edges of contact of the graft to the fragments little pieces of spongy bone, secured from near the epiphyseal line, should be carefully packed. These small grafts are very important and the results have been more uniformly good since they have been used. In this mechanical age I think that a motorized circular saw is necessary to secure a bone graft. In one of the illustrations I showed a method of outlining the graft with multiple drill holes, a chisel being used to separate the graft between the drill holes. It can be done very readily if a thin bladed chisel is used and if care in chiseling is exercised. The transplant so removed is rough on the edges, which is really preferable to the more smooth, even almost polished, surface that follows the use of the circular saw, for it permits more readily revascularization of the transplant.

SIGNIFICANCE OF AN EPIDEMIC OF DENGUE

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Dengue, "breakbone fever" or "dandy fever" is an acute, febrile disease due to a filtrable virus which is constant in the peripheral circulation during the febrile stage. The disease is endemic in many tropical countries, and many explosive epidemics have occurred in subtropical and temperate climates.

Dengue is transmitted naturally by only one species of mosquitoes, Aedes aegypti, in the United States (so far as now known), while in the Philippines, in addition to Aedes aegypti, another species of Aedes, albopictus, has been shown to be infectable. Ashburn and Craig [1] demonstrated in 1907 that a virus in the circulating blood was the causative agent, although they apparently were in error in ascribing transmission of the disease to Culex quinquefasciatus, as was later proved by the studies made by Cleland, Bradley and McDonald [2] in 1916, Chandler and Rice in 1923 and Siler, Hall and Hitchens [3] in 1925. Simmons, St. John and Reynolds,[4] working in the Philippines, found that for an interval of at least nine days after feeding on a dengue patient, Aedes aegypti was not capable of transmitting the disease (extrinsic incubation period) but was infective after about twelve days following the ingestion of the blood from the patient. Once infective, Aedes aegypti remains so the remainder of its life, provided the atmospheric temperature continues favorable. It has been demonstrated by Blanc and Cominopetras that with atmospheric temperature below 18 C. (64.4 F.) the virus in mosquitoes becomes noninfective. This accounts in a large part, perhaps, for the cessation of violent epidemics on the approach of

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Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

1. Ashburn, P. M., and Craig, C. F.: Philippine J. Sc., sec. B. **2**: 93, 1907. Craig, C. F.: The Etiology of Dengue Fever, J. A. M. A. **75**: 1171 (Oct. 30) 1920.
2. Cleland, J. B.; Bradley, Burton, and McDonald, W.: M. J. Australia **2**: 179 (Sept. 2), 200 (Sept. 9) 1916.
3. Siler, J. F.; Hall, M. W., and Hitchens, A. P.: Proc. Soc. Exper. Biol. & Med. **23**: 197, 1925.
4. Simmons, St. John and Reynolds: Experimental Studies of Dengue, Bureau of Sc., Manila, Bureau of Printing, 1931.

winter. However, Aedes aegypti is essentially a day biter, and preferring to remain indoors, as this house mosquito does, outdoor temperature is not a fair indicator of its ability to continue to administer infecting bites.

We have mentioned the fact that, in order to become infected, Aedes aegypti must secure blood from the dengue patient during the first forty-eight hours of the initial fever and that there is an extrinsic incubation period (in the mosquito) of about twelve days; then there is an intrinsic incubation period (in man) of from four to ten days. In all these characteristics and in the principal mosquito vector, namely, Aedes aegypti, the epidemiology is essentially identical with that of yellow fever, although unlike yellow fever in that ordinary laboratory animals have not yet been proved susceptible to dengue virus infection.

As to immunity, all endeavors at the establishment of cross immunity between yellow fever and dengue have proved negative. The immunity produced by an attack of yellow fever is practically absolute, while an attack of dengue produces a very definite immunity lasting only for a few years. It may be assumed that in a period of from five to ten years' freedom from dengue a given urban population in infectable territory is again susceptible to this disease. To illustrate, in the epidemic of dengue at Galveston, Texas, in 1917 it was estimated that 50 per cent of the population suffered attacks. Only five years later (1922) another epidemic occurred in which it was estimated that 60 per cent of the city's inhabitants were attacked.

The first recorded epidemics of dengue occurred at Cairo, Egypt, and Batavia, Java, in 1779, and in Philadelphia in 1780 (described by Benjamin Rush in 1818). Since that time this disease has ever brought to mind its striking similarity to yellow fever. Long before the transmitting agent of yellow fever (the mosquito Aedes aegypti) was definitely known, physicians in various parts of tropical and temperate zones observed and recorded facts concerning the parallel epidemiology of the two diseases. Strangely enough, Linnaeus eighteen years before the recorded epidemic in Cairo had found in Egypt also and described the mosquito that is now known as Aedes aegypti and which is a vector—at least the most important vector—of both yellow fever and dengue. Epidemics have occurred at more or less lengthy intervals in various areas between parallels 32° 47′ N. and 23° 23′ S., and even beyond these lines at times. In other words, during favorable seasons of warm and wet summer months with resulting heavy production of Aedes aegypti, plus the introduction of a first case or the importation of infected Aedes aegypti, limited epidemics have occurred in areas beyond its ordinary boundaries; e. g., Philadelphia, Constantinople, Athens and other points in Greece.

The rapidity with which dengue spreads in nonimmune populations is probably exceeded only by influenza. The fact that in most epidemics of dengue there is a relatively large percentage of cases of mild type, many unrecognized, or not officially reported, lays the foundation for widespread mosquito infection. In any given epidemic, ambulatory patients are not only more exposed to bites of mosquitoes in daytime than the bedridden patients, but in travel, although restricted, chance to infect mosquitoes over a wider area is increased. This is responsible, then, for the greater rapidity of the spread of dengue than in the case of yellow fever. On the other hand, the dreaded mortality from yellow fever incites greater activity in preventive measures, such as prompt and accurate reporting of cases, greater care in protecting not only the sick but the well from mosquito bites, the employment and training of medical and sanitary personnel, and the expenditure of funds for epidemiologic investigations and vector control.

One frequently hears, even today, that dengue is only a painful disease of short duration, the patient "sick enough to die but doesn't." This is misleading. While recovery occurs in uncomplicated cases of dengue, the same may be said of many other diseases.

According to records, the city of Athens, Greece, had approximately 239,000 cases of dengue up to September 4, in the 1928 epidemic. This represented 75 per cent of the population of the city. The registered deaths from all causes in Athens for the month of August 1928 totaled 1,268, of which 413, or 32.6 per cent, "were certified as due to dengue." In Piraeus, a city of 136,000 during the same month the registered deaths from all causes numbered 592, of which 176, or 29.7 per cent, "were caused by dengue."

In the average epidemic of yellow fever, about 10 per cent of the cases are fatal, the same as from typhoid. But in the days when diagnoses of yellow fever were made only when the patient had "black vomit" and died, it is no wonder yellow fever mortality seemed so appalling. As time goes on and research progresses, more and more is being learned about the epidemiology and the endemic characteristics of yellow fever and dengue. Through immunity tests for yellow fever in recent years developed by Sawyer and others, it is now known that yellow fever in its present endemic areas is not a deadly disease at this time but that the area of endemic prevalence is more widespread than was formerly considered.

The last pandemic of dengue in the Southern states occurred in 1922. The first cases were reported from Tampa, Fla. A relatively light prevalence in many communities was reported the following year, and in this country no epidemic followed for eleven years, when in 1934 dengue was reported (July 16) in Miami, Fla. The origin of the first case of dengue in the Miami epidemic is not known. It is assumed, of course, that either an infected person or an infective Aedes aegypti mosquito came into Miami by boat or by airplane from some endemic tropical center. Formerly dengue and yellow fever gained entrance to the United States by means of traffic across the Mexican border or by sailing vessel or steamship to Atlantic or Gulf ports. Today, with rapid airplane traffic between Cuba, the West Indies, South America, Central America and Mexico, an added danger exists. Yellow fever is now present on the Western hemisphere only in parts of Brazil, Colombia and Bolivia, so far as known, and, too, only in certain jungle areas.

The United States Public Health Service in 1931-1932 demonstrated the facility with which Aedes aegypti may be carried long distances in aircraft.[5] Until this apparent menace was demonstrated and the newer knowledge concerning the extent of endemic yellow fever, particularly in Africa, with so-called jungle fever in Brazil, Bolivia and Colombia, with at least a dozen additional species of mosquitoes now known to be infectable with yellow fever virus, and some species of monkeys readily susceptible, health officials the world over were hopeful of ultimate eradi-

5. Griffitts, T. H. D., and Griffitts, J. J.: Mosquitoes Transported by Airplanes, Pub. Health Rep. **46**: 2775 (Nov. 20) 1931. Griffitts, T. H. D.: Air Traffic in Relation to Public Health, Am. J. Trop. Med. **13**: 283 (May) 1933.

cation of yellow fever. Today there is a feeling of concern lest our own infectable areas may again be invaded, and that Old World territory, where the vectors abound and where yellow fever has never before stalked, may experience widespread and devastating epidemics.[6] One infective mosquito traveling in an airplane from the home of yellow fever (Africa) to India could be the spark to start the conflagration.

The facility with which dengue spread in Miami in the summer of 1934[7] and thence into practically all parts of Florida and into parts of Georgia shows with what rapidity and certainty yellow fever, too, can still spread in our own country. Yellow fever was rather promptly brought under control by the application of anti-aegypti methods in our latest epidemic (1905), but it is erroneous to consider that this disease has been kept out by mosquito eradication in our Southern ports. Immunity against yellow fever in the Southern states or infectable territory today may be considered nil so far as danger of epidemic spread is concerned. It is doubtful whether 0.1 per cent of the population of infectable territory is protected by a previous attack of yellow fever. Consequently, we are still vulnerable to its devastation if once reintroduced.

When we were faced with the prevalence of dengue in Miami in July 1934 and the responsibility of preventing its spread, surveys in various cities, towns and villages reminded us of what we already knew—that in spite of our civic pride and detestation of mosquito bites there is still a complacency sufficient to tolerate an abundant production of Aedes aegypti throughout the habitat of this vector. In a period of two months dengue was reported in seventy municipalities in thirty-one counties in Florida and a few places (principally Savannah) in Georgia.

Practically every urban community in the South has its array of artificial containers, from flower vases to catch basins, cuspidors and discarded automobile tires, producing Aedes aegypti. For example, the city of Tampa in eight weeks reported finding 1,091,823 containers (potential mosquito "hatcheries"). Of these, larvae were found in 20,864, or approximately 2 per cent. This was an unusually dry season (average rainfall of 1½ inches a month for this period). It is interesting to note that in Miami for a like period only 56,598 potential breeding containers were reported, with 38,401, or 68 per cent, of the total actually breeding.

While we long assumed that only one mosquito (Aedes aegypti) transmitted yellow fever and dengue, it is now known that more than a dozen species in Africa and Brazil are susceptible to infection with yellow fever virus and that at least two species of Aedes (aegypti and albopictus) have been proved infectable with dengue in the Philippines. (Albopictus has also been infected with yellow fever virus.) It is worthy of note, at least, that the greater percentage of cases of dengue in the Florida epidemic occurred in coastal areas and that Aedes taeniorhynchus (the great salt marsh pest of Florida) has been proved susceptible to yellow fever virus in Brazil.

The senior author of this paper, in the course of malaria investigations over a period of more than twenty years, has had occasion to observe Aedes aegypti conditions in various parts of infectable territory. He states without reservation that Aedes aegypti production is not now under control and never has been brought under reasonable control, except under stress of imminent danger of an epidemic of dengue or yellow fever. Only two factors have been concerned in our freedom from yellow fever during the past thirty-one years: (*a*) the constant vigilance in our national quarantine service and (*b*) the practical freedom from epidemics in Latin American countries to the south of us. How long the latter condition may prevail is mere conjecture.

6. Sinton: Suggestions with Regard to Prevention of Spread of Yellow Fever to India by Air Traffic, Health Bull. 20, Malaria Survey of India, Kasanli, India, Delhi, India, 1934.

7. Griffitts, T. H. D.: Dengue in Florida, 1934, J. Florida M. A. **21**: 395-397 (March) 1935.

ABSTRACT OF DISCUSSION

DR. V. H. BASSETT, Savannah, Ga.: The authors have presented a message of great importance to Southern cities and especially to those on the Atlantic and Gulf coasts, because they have shown what we have long suspected, namely, that the fact that we have not had yellow fever was not due to our having conquered the insect vector but to the fact that neither the infected insect nor an infected human host has come into our territory as a source of virus. With the increased rapidity of transportation, especially by airplane, the danger of this is evident. The reason Aedes aegypti has not been controlled more carefully is largely due to the fact that it is not as annoying a mosquito as the other city mosquitoes. Another reason is that the adaptation of Aedes aegypti to man has been most exquisite in the delicacy of enabling it to breed in extremely small amounts of water and in the most unexpected places. No control that is not in itself searching will suffice. There have been epidemics in Savannah since early times; in 1913, when 20,000 people were sick in a population of about 70,000 people; in 1922, when 30,000 were involved in a population of about 85,000, and in 1934 when strenuous efforts were made for prevention after we found out what was going on in Florida and had fully 10,000 sick. The question of whether or not Aedes aegypti may not be altering its habitat and becoming more adapted to rural conditions is important. The question of the percentage of residences in which breeding was going on is important as a factor in determining the spreading of the disease. We made a test when the last epidemic began and found that breeding existed in 20 per cent of the yards. The most strenuous efforts were made to control this, and we were able to reduce that to only slightly below 10 per cent. I think we would have reduced the percentage more decidedly if I had been able to control breeding in roof gutters; not on open roofs, because mosquitoes will not breed there unless there is a great deal of shade. They breed in very little water, under leaves. It is considered that reduction of the breeding index of mosquitoes is effective if reduced below 5 per cent. There is a chance that one house where breeding exists infests four or five houses in the immediate neighborhood. I was sorry to hear what the authors had to say about Aedes taeniorhynchus, because if that mosquito proves to be a vector it is going to make it much more difficult for the cities located as is Savannah, near salt marshes, to prevent these epidemics. Fortunately, Aedes sollicitans is the more common marsh mosquito on our part of the coast and we do not find Aedes taeniorhynchus so often.

DR. T. H. D. GRIFFITTS, Savannah, Ga.: We seem to have aroused considerable interest by mentioning Aedes taeniorhynchus. This mosquito has been proved susceptible to yellow fever virus. Nobody at present knows whether this species plays any part in the spread of dengue. I mention that because of the fact that the original yellow fever mosquito is also the outstanding violator in the matter of dengue. One should not overlook the possible significance of the frequently greater prevalence of dengue in costal towns. The fact must be lost sight of that in case yellow fever should break out it might not be limited to one section of a city, as was often the case in former epidemics. Yellow fever used to be largely confined to the French quarter in New Orleans. With automobile transportation it is not unusual for an Aedes aegypti mosquito to get into a car parked by the side of the house overnight and be carried rapidly 5, 10 or 15 miles, even with the windows and windshield open, as I have demonstrated. So, while we have reduced certain reproduction areas or places by doing

away with above-ground cisterns, a prolific source of Aedes aegypti in former days, methods of rapid transportation will cause rapid spread of either yellow fever or dengue in modern times, such as did not exist in the "horse and buggy days." I think that is true also in spreading Aedes aegypti to the smaller communities and even to farmhouses, where they are occasionally found today, whereas this mosquito once was regarded as a city dweller.

HERNIOPLASTY IN PATIENTS PREVIOUSLY TREATED BY THE INJECTION METHOD

PRELIMINARY REPORT

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The late Dr. J. Chalmers Da Costa,[1] referring to the work of Lannelongue, said:

> Lannelongue has for certain cases returned to the old injection plan, using a ten per cent solution of zinc chloride. The hernia is first reduced and is held up by an assistant who closes the internal ring with a finger and also holds the cord aside. Several injections of ten minims each are thrown into the region of the internal pillar and into the canal behind and outside of the cord. The surgeon must be careful that no zinc solution escapes into the subcutaneous tissue. The effect of the chloride of zinc is to cause the formation of quantities of fibrous tissue. It is scarcely to be expected that a cure so produced will be permanent in an adult, though it may be in a child.

As far as we know, Dr. Da Costa had never practiced the injection method, yet the foregoing statement revealed hope rather than doubt, curiosity rather than arrogance.

The rationale of the injection method, though perfectly reasonable and simple, was long rejected by the medical profession as unheard of insolence. When finally revived in recent years it had merited the following remarks in the British Medical Annual for 1931: "When we remember the scepticism with which the injection treatment of varicose veins was first received by the profession it would be unwise to refuse the slightest credence to these observations."

The injection method has its limitations. The fact that some authors consider it to be the method of choice in all reducible hernias of moderate size has prompted this preliminary report. The observations here presented indicate that sliding hernia is a direct contraindication to the injection treatment and that any attempts at the ambulant treatment of this condition may be fraught with disappointment and perhaps danger. Moreover, the diagnosis of sliding hernia before operation is seldom possible and when it is ventured it is done so with a degree of uncertainty. Once the treatment of an undiagnosed sliding hernia has been initiated, the outcome will depend on the surgical judgment of the operator. If he possesses a fair amount of it together with the profits of personal experience, he will know when and why to stop injecting.

REPORT OF CASES

Five patients in our private practice had submitted to the operative repair of sliding hernia after a variable number of injections in the usual manner and spaced at biweekly intervals. The number of injections varied from sixteen to thirty. The average lapse of time between the last injection and the operation was ten months. The patients were all men well over 40.

It was noted during the treatment that the canal was eventually obliterated and that the external ring was hardly palpable as such. No sooner was the truss removed, however, and the patient stood up erect, than a large hernial mass appeared in the canal, growing larger on straining and disappearing on lying down. During the various follow-up examinations it was found that the mass had regained a certain degree of mobility, increasing its excursion on coughing or straining. It was also remarked that the patients had a subjective feeling that the hernia was gone, although the swelling appeared in its customary place.

Under low spinal procaine hydrochloride anesthesia an incision was made in the inguinal region. The aponeurosis of the external oblique muscle was divided. An attempt to separate the aponeurotic sheath from the underlying muscle revealed dense fibro-aponeurotic tissue replacing the normal plane of cleavage. The conjoint tendon was next exposed and we observed a vast amount of newly formed cicatricial tissue extending in various directions. The numerous adhesions made it difficult to separate the mass from the posterior aspect of the external ring. The hernial mass was found to be composed of peritoneum forming the anterior wall. Closely adherent to it was a portion of the cecum. This viscus was separated from the sac, peritonealized and reduced. The redundant peritoneum forming the anterior wall of the sac was transfixed with a suture-ligature and cut away. The repair of the muscle wall was performed according to Bassini's method with transplantation of the cord. This patient was a man, aged 42.

Three other cases, originally diagnosed as right inguinal hernias, presented a sliding hernia of the cecum in two, and a portion of the bladder in the third. The fifth case, diagnosed as a left direct inguinal hernia, was found to present a sliding hernia of the sigmoid and omentum.

In order to explain the obvious failure of the injection treatment in these cases, a brief consideration of the subject of sliding hernia is submitted.

ETIOLOGY

1. In the embryogenic group, one of the testes prior to its descent has grown to the wall of the cecum either with or without a special fold containing blood vessels. Having descended, the testicle drags the cecum along with it into the inguinal canal. According to Fleissig,[2] a sliding hernia may be due to the ptosis of the cecum from a congenitally low position. Although the mesentery of the ascending, descending and iliac portions of the colon normally adhere to the posterior abdominal wall and thus become lost, in some cases these primitive structures may persist. This may result in preternatural mobility of these parts of the large bowel and lead to hernia.

2. Mechanical causes, such as constipation, lifting heavy weights and other factors that influence intra-abdominal pressure, may be responsible. The continuous filling and distention of the colon may result in the yielding of the layers of the mesentery; these layers separate, leaving the colon under its serous coat to emerge through the inguinal ring.

3. A simple hernia of the small intestine may initiate the condition, and after the sac is distended by the

1. Da Costa, J. C.: Modern Surgery, ed. 7, Philadelphia, W. B. Saunders Company, 1918, p. 1139.

2. Fleissig, quoted by Vengerovski.[6]

coils of the small intestine they pull after them the adjoining parietal peritoneum in the neighborhood of the internal inguinal ring. This peritoneum in turn pulls on the portion of the large bowel, which is partly peritonealized.

4. According to Tuffier [3] and others, the cecum has two ligaments, the upper and the lower. When the upper ligament is weakened, the ascending colon drops below into the inguinal canal. The cecum either remains in place or follows the large intestine into the hernial sac.

5. Severe malnutrition, senile debility and a weakening of the abdominal wall may favor the development of sliding hernia. At this point it is interesting to note that a so-called relative hernia is a condition also associated with the debilitated state. According to Bickham,[4] in this condition there is no absolute hernia existing in a sense that a part of the abdominal contents pass through and protrude from an opening in the abdominal wall. But there may be a marked bulging in asymmetrical or symmetrical fashion of a considerable area of the weakened abdominal wall between the umbilicus and the anterior superior iliac spine, caused by the transverse stretching of the aponeurosis of the external oblique sufficiently pronounced to constitute a relative hernia. It is needless to say that in the latter condition the injection treatment is contraindicated.

ANATOMIC CONSIDERATIONS

Only those parts of the large intestine can be involved in a sliding hernia which are not covered on all sides by peritoneum. Properly speaking, this would limit the sliding hernias to the involvement of the ascending or descending colon only. But in a larger sense adjoining loops of bowel and other viscera often participate in a general descent, especially the bladder, appendix and cecum. These organs are drawn down into the sac by the peritoneum investing them.

The posterior parietal peritoneum becomes detached from the underlying structure. It slides into the internal inguinal ring and carries with it the attached loop of large intestine. Next the intra-abdominal pressure forces the intestine into the point of least resistance: the internal ring. The ring now relaxes and the bowel travels down the canal, aided by its own weight.

Sliding hernias are classified as to the variety of sac into three groups:

1. Hernia with complete sac (intraperitoneal).
2. Hernia with incomplete sac (paraperitoneal).
3. Hernia without sac (extraperitoneal).

In the first group the mesentery is long and is found in the sac itself, and the mesentery appears consequently as the continuation of the sac. Complete sacs are generally present in congenital hernias and may contain the cecum, appendix, ascending colon or other viscera.

In the second group the mesentery is short, and the intestinal walls and mesentery are often adherent to the sac. This forms the largest proportion of cases. Here the intestine, which is covered by peritoneum only on its anterior and lateral surfaces, is directed into the sac. When the intestine reaches the sac its posterior nonperitonealized surface adheres to the floor of the inguinal canal or the internal ring.

Sacless hernias are infrequent and by some observers considered as prolapse of intestine through muscle.

DIAGNOSIS

The diagnosis of sliding hernia is usually made in the operating room. The surgeon should always be on his guard for hernia of the large intestine. Certain symptoms, however, may point to the possibility of a sliding hernia before the injection treatment is begun or surgery is employed; suspicion should be aroused in the presence of the following signs:

In all voluminous hernias.

In all large hernias with a wide inguinal ring.

When the mass is easily reduced in its medial aspect while the posterolateral aspect is reduced with difficulty.

When the patient cannot tolerate a truss.

In the presence of enteroptosis.

In the presence of a doughy consistency on palpation.

On palpating the hernial mass following reduction, one may occasionally distinguish the intestinal wall from the hernial sac.

Occasionally one may succeed in palpating the appendices epiploicae.

If the large intestine is distended with water, the hernial mass is increased and becomes firmer, followed by the disappearance of tympani on percussion.

Roentgen study may point to the possibility.

COMMENTS

The reason why sliding hernia does not respond favorably to the injection treatment becomes evident when one studies the mechanism of this condition.

The nonperitonealized posterior portion of the large intestine becomes adherent to the internal ring and the floor of the inguinal canal.

This attachment becomes firmer as the hernia progresses. The apparent reduction of the mass in cases reported was really not true reduction. It resembled a rubber glove with its outer globular surface inverted by manipulation from convex to concave.

The actual lumen of the internal ring was not diminished by the treatment, and the upper portion of the inguinal canal could not be obliterated because of the attachment of the large bowel around the ring and in the canal.

To obtain satisfactory results as in simple hernias of the small intestine it would have been necessary to go through the layer of peritoneum that serves as the anterior wall of the incomplete sac. In this case the solution would have found its way into the peritoneal cavity or into the large bowel. The outcome would be obvious.

SUMMARY

1. In the presence of a sliding hernia and in the so-called relative hernia, the injection treatment is definitely contraindicated.

2. The diagnosis of sliding hernia being often impossible before operation, injections are frequently made with unsatisfactory results.

3. Sliding hernias occur in from 1.2 to 1.5 per cent of all hernias. They are usually right sided. They have a considerable tendency toward strangulation. They are often complicated by inflammatory processes within the hernial sac and occasionally by appendicitis. Baumgartner [5] cites forty-four cases of strangulation out of 159 cases of sliding hernia, or 27.7 per cent. Vengerovski [6] reports eight cases that were all right sided, involving the cecum and all presenting incom-

3. Tuffier, T.: Etude sur le caecum et ses hernies, Arch. gén. de méd., Paris **20**: 52-65, 1887.
4. Bickham, W. S.: Operative Surgery, Philadelphia, W. B. Saunders Company **4**: 160, 1924.
5. Baumgartner, A.: Les hernies par glissement du gros intestin, Thèse de Paris, 1905.
6. Vengerovski, I. S.: Sliding Hernias of the Cecum and Hernial Appendicitis, Sovet. khir. **8**: 30-42, 1935.

plete hernial sac. Of these eight cases three were strangulated and three were complicated by acute appendicitis within the hernial sac. The total number of cases in which injections were done by us was 386, so that in our experience the five reported cases of sliding hernia constituted approximately 1.3 per cent.

4. In the presence of a large hernia that resists all attempts at injection and recurs after a reasonable time has elapsed it is our practice to consider the possibility of a sliding hernia and resort to surgery.

5. Previous injections and the fibrous tissue proliferation resulting from the injections in no wise interfere with the operative procedure or the operative results.

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THE PSYCHONEUROTIC DEPRESSION

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I have chosen the psychoneurotic depression as a subject that deserves more attention than it has been accorded in the current psychiatric literature. This discussion, and a recent paper given before the American College of Physicians at Detroit by Dr. Austen Fox Riggs and Dr. Horace K. Richardson, may be considered as forerunners to a general and statistical survey of the problem presented by the psychoneuroses and their treatment at the Austen Riggs Foundation. Funds for this have been granted by the Markle Foundation and the study will be carried on by Dr. Gaylord Coon and Miss Alice Raymond.

Any inspection of the work at Stockbridge indicates that the psychoneuroses, instead of being distinct and separate entities, appear to be variants of the fundamental mental and physical dysfunction caused by the patient's underlying maladaptation to life. The variation in the expression of this maladjustment is probably determined by the basic elements in the patient's individuality. The stresses and strains in the environment are not causal and are of significance only as secondary and precipitating factors acting on this maladaptation.

Any adequate understanding of the neuroses must be based on a knowledge of the physical as well as the mental evolution, development and structure of man. The evolutionary significance is largely limited to the fact that more and more of the functions of existence have assumed automaticity, thereby releasing man's attention for the further improvement of the technic of living and the preparation of a more congenial environment. Any interference by the individual in this trend of development or any tendency to resist it results in maladaptation, since it either maintains him on or forces him to an inferior level of living that is inadequate for his successful relationships with his fellow man. Adaptation has anatomic and physiologic as well as psychologic significance and is based on the functional divisions of the central nervous system, the more recently acquired unit exerting a retarding or inhibitory influence on the more primitive. The anatomic level below the cerebrum is probably of greatest significance in this discussion, since incomplete subordination of the function of this level to the needs of the forebrain probably constitutes the functional or anatomic foundation for the neuroses. Incomplete integration is seen in the amplification of the sense impressions, the increased conscious responses to emotions, the marked sympathetic manifestations and even the motor responses. Complete integration inhibits the violence of response from the lower level while making use of its dynamic potentialities.

The inner experiences of man are built on this foundation and we can further reconstruct our understanding of the development of the psychoneuroses by correlating the psychologic with the other processes of maturation whereby complete integration is attained: The infant represents roughly a conscious though subcortical mechanism, perceiving imperfectly, feeling violently and responding to these emotions by instinctive action. This is the starting point of human behavior, subsequent additions being determined not only by the stimulation of the physical and psychologic environment but also by the skill with which the child learns to develop the potentialities of the forebrain.

The child lives in one of the most complex interactions of individual and environment, namely, that of the parent-child relationship, wherein the oversolicitous parent in his response to parenthood reacts on a more or less primitive level where exaggeration of expression of love and attention tend to predominate. This, while favorable to the first stages of development, can become a contributing factor in the origin of the individual's maladaptation and subsequent neurosis.

The over-idealistic parent, with zealous intent but little intelligent restraint, may impress on the child distorted standards of behavior as patterns of normal adult reaction. No consideration is given to the fact that the child also responds primitively because of his incomplete development and therefore further distorts and elaborates these impressions to the point where he sets unattainable standards of behavior for himself which he assumes to be desirable measures of conduct and a necessary protection from the dreaded consequences of self indulgence. Self restraint, instead of objective behavior, becomes the means to his ideals. This represents a physiologically expensive mode of behavior. This may be called overmanagement of self, since autonomic functions continue to absorb the attention.

Often the child tries to modify the exhausting tension of this type of existence by seeking the psychologically tonic effect of approbation. If parental approbation is missing or withdrawn, some substitute is found; but since approval in any form is a treacherous and capricious ally, dependence on it creates an obvious insecurity. The normal increase in the strains of the environment accentuates this insecurity. Exposure to temptation increases, while relaxation of restraint is made to seem more alluring by the examples of the unpunished self indulgence of others. Thus conflicts are created and heighten the already existing tension.

This summary has included the normal preface to adolescence which usually ends in normal emancipation or revolt. It has also indicated the pattern of the primitive response which often persists in the sensitive individual, determining his type of maladaptation to life. If in early adult life the individual cannot drop his emotional dependence and his overvaluation of sensations, his stabilization is maintained on an inadequate level and complete integration is absent. His thinking is largely influenced by feeling, his psychologic and physiologic reactions are characterized by exaggera-

Read before the Section on Nervous and Mental Diseases at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

tion or even violence, and equilibrium is maintained at an extravagant cost of constant self management. Normal reactions, such as resentment and hate, are inconsistent with his idealistic codes and are suppressed. Obstacles to progress are never tolerated with poise and security but are met with grim determination and a rigidity of purpose that exhausts the individual and often causes secondary somatic or vegetative symptoms. Underneath the appearance of moderate self assurance that is maintained by success achieved under auspicious circumstances or at unreasonable cost, there lies a welter of conflict. Self pity, as a protective mechanism, supplements in large part the persistent drive for approbation. Enjoyment and contentment are dependent on tangible success and are seldom if ever related to relaxation or ease. A drive to be right at all costs and in all ways develops an intolerance of attitude that further complicates the individual's life.

It is my impression that this form of maladaptation is productive of such a state of masked tension that the individual is unable to withstand any moderate degree of frustration and loses his resistance to the normal physiologic affective depressions. No matter what the precipitating cause may be, the neurotic response of this type of individual usually is a depression, and, while it is common to speak of this as a reactional condition, I question the advisability of such a nomenclature, since it is not an impossible environmental situation which by its severity causes the person to collapse, but a specific disability in the patient due to his inferior technic in living and consequent inability to withstand any moderate obstacle.

The symptoms prodromal to the active depression are of considerable significance. The underlying maladaptation is usually unrecognized by the patient, but he recognizes that something is amiss and attempts to surmount his uneasiness by redoubled efforts at self management, thereby aggravating his condition by the abandonment of rest and relaxation. Any number of alarming sensory symptoms appear and perplex the patient. Frequently the depressive symptoms begin only when the patient is no longer able to stand this uncomfortable condition. Finally, however, the depression develops and is less well tolerated than the physical discomfort, since its associated psychologic dysfunction renders the individual incapable of any task requiring mental application. Such a state represents the failure of the individual in his self management and, as a patient, he succumbs to illness with resentment, intolerance and despair.

This attitude of resentment toward the malady is an important diagnostic feature, since it often differentiates this condition from the manic-depressive psychosis wherein the patient accepts the illness as an inevitable punishment for his unworthiness. Probably the difference between the psychoneurotic depression and other forms is not one of degree in a similar or the same process, although one may fuse into the other. Possibly the difference lies in the attitudes and inner experiences of the individual. Certainly the psychoneurotic depression is usually more clearly and closely associated with the patient's dynamic maladaptation and is less closely dependent on so-called mood swing. It is often impossible to make a differential diagnosis—certainly there are no pathognomonic signs or symptoms.

In the psychoneurotic depressive state the symptoms are less constant than the attitudes of the patient. Feelings of unreality and even false beliefs and fixed ideas may appear in transitory episodes. Suicide may become a problem as an expression of the patient's resentment toward the world that has threatened his progress toward success. The patient accepts his pessimistic interpretation of his present status as a true representation of the future, believing that others recognize the validity of his assumption but are too kind to acknowledge it. Suspicion follows and leads him to avoid social contacts. When the disturbance in cerebration causes failure in attention, and indecision becomes marked, the patient fears that he is "losing his mind." He views all bodily and sexual symptoms as indicative of a failing physical apparatus. These fears, added to the anxiety, further increase the tension to the point at which agitation may result.

The patient's attitude toward his illness presents a difficult picture. While bent on proving the seriousness of his disability as demonstrated by the unfavorable comparison of his present with his past performance, he appears unable to endow this form of illness with any of the characteristics usually associated with other disease processes. He is at first intolerant toward the stated cause of his illness; he has no faith in psychotherapy and has little or no interest in the significance of his symptoms.

Lack of time restricts the discussion of treatment. I shall, however, refer to some of the major points. Therapy has certain phases. Attention is first centered on the explanation to the patient that his illness is a condition resulting from the strain of the preceding maladaptation. Repeated emphasis should be given to the favorable prognosis. Attention is next given to the education of the patient for an understanding of the normal function of the central nervous system and its correlation with the mental processes and inner experiences of man. The presence of the many sensory symptoms provides ample material for the practical explanation of the interrelationship of the physical and emotional factors. Following this informative phase of the treatment there is a period in which the patient's actual maladaptation and the critical problems that have developed as a result of this neurotic maladjustment are considered and formulated for a practical insight. The last stage of the treatment is centered around the reeducation of the patient for a better objective adaptation.

This categorical outline of the treatment has to be adapted to the patient and correlated with the various progressive stages of his convalescence. The initial period of frank emotionalism often ends in a brief phase of false optimism resulting from the reassurance and the superficial insight that the explanation of the nature of the illness has provided. However, with this decrease in depression the patient becomes more aware of the underlying anxiety and apprehension. His attention becomes focused less on self and increasingly more on his physical and psychologic environment. As he becomes more objective and begins to attain insight, an alarming sense of discouragement often appears and is confused with the former sense of depression. It is at this stage that the patient begins to acknowledge his actual problems and may even sense the close relationship between these and his maladjustment. This period should include a frank and searching survey of the patient's life by the patient and the physician, with the latter guiding and interpreting the emotional reactions of resentment and rebellion that may result from the material exposed. Subsequently insight must be formulated and applied for a better adaptation. Until some definite degree of achievement in the practice of

his new insight is attained, the patient seldom regains any of his sense of well being. During this phase the patient requires great supervision and support lest his discouragement and petty failures precipitate a chronic anxiety state. It is imperative that the relatives be educated to the needs of the patient during convalescence lest any competitive situations with those nearest him develop.

I should like to return for emphasis to the first and last phases of the treatment. It is expedient to stress repeatedly the definition of the nature and purpose of the illness until the patient has come to accept it as a fact before beginning any discussion of the more obvious emotional and situational problems. If the patient can be brought to a realization that the illness is a result of a long period of strain, he is then in a better position to accept the necessary therapeutic requirements of rest and temporary relinquishment of all responsibility until some degree of total efficiency has been restored. In the last stage of treatment the patient's attempts at rehabilitation should be directed toward a fractional resumption of his normal life. He must be protected from the influence of an elation during this period, since the initial attempts at normal adaptation should be made while the patient is still sobered both by his illness and by the import of his newly acquired insight.

SUMMARY

1. As a variant of the psychoneurotic maladaptation, the psychoneurotic depression is characterized by emotionalism and sensory discomfort indicative of a thalamic dysfunction.

2. Environmental strain acts only as a precipitating cause of the depression.

3. The fundamental maladaptation represents a faulty use of the total equipment and is often due to persistence of immature patterns of response.

4. Treatment varies only slightly from the usual treatment of the psychoneuroses. It should be directed primarily toward reeducating the patient to understand and use his normal equipment more completely, objectively and easily.

ABSTRACT OF DISCUSSION

DR. WILLIAM NELSON, St. Louis: While what I have to state embraces certain points of divergence of views, I want to pay tribute to Dr. Kimberly's elucidating and terse presentation. I can't think of a psychoneurosis as developing always out of a parent-child relationship. I accept Dr. Kimberly's view of the inadequacy of the personality to meet life's situation on the part of the individual who becomes psychoneurotic. One thinks, of course, of the early experiences of an individual in connection with parental relationships or parental substitutes. However, there are certain things in the individual who is potentially inadequate, anatomically and physiologically as well as psychologically, that make for failure in his adjustment. These factors may be many or few. There are certain states that tend to induce an attitude of psychoneurosis. I like to think of the psychoneurosis as a mode of dealing with one's experiences rather than based on its etiologic development, and think of the etiologic evolution in terms of a rather manifold experience coming to an organism in life that is not integrated properly and not able adequately to deal with those experiences. Many different situations in life that tend to develop this must be included. I have some well authenticated cases of psychoneurosis, from a rather close analysis, in which the earlier childhood of the individual has been of a fairly normal character. I say "fairly normal" in proportion to the experiences that that individual has had come to him. However, there are certain stresses in life to which the potential psychoneurotic is not subjected in earlier life, that come later, and so the psychoneurotic attitude may not be manifest until later, whereas a potential situation does exist. So that I would rather shift the emphasis in psychoneurosis to have its meaning in the mode of dealing with the experiences rather than in the character of evolution, because the basis for evolution, as I say, comes from many different aspects. I must think, then, of the psychoneurosis as a disparity between the adequacy of the individual and the experience that he has had, and I must think of it as a mechanism of escape from a situation. Therefore it constitutes a fabrication, a substitution, and the individual fools himself into believing that certain factors are responsible for the situations that do not exist. So far as the treatment aspect of the disease is concerned, I think that Dr. Kimberly's is quite satisfying: first, the analysis of the situation, having the patient conversant with the problem, before remedial measures are attempted. Second, the plan of persuasion and acceptance either by direct or indirect approach in bringing about an expansion of the personality.

DR. CHARLES H. KIMBERLY, Stockbridge, Mass.: I think that perhaps I have been a little too hard on the parents. I agree that many of the psychoneuroses seem to be escape mechanisms but it is my impression that this type of neurotic depression is more a result of the individual's drive for perfection. I think that I have indicted the parent too severely, not meaning to do this as much as the whole environment of childhood, when the patient-to-be begins to think that it is necessary for him to be perfect; he wears himself out trying to do everything that is right. I think that I accepted the point that it is not the parent entirely but, perhaps, the whole overprotective aura of childhood, the aura that is trying to develop this person into something he probably has no chance of ever being.

PRESENT STATUS OF THE X-RAYS AS AN AID IN THE TREATMENT OF GAS GANGRENE

JAMES F. KELLY, M.D.
AND
D. ARNOLD DOWELL, M.D.
OMAHA

In August 1928 Dr. J. R. Dwyer, one of the attending surgeon's at St. Catherine's Hospital in Omaha, came to the x-ray department and inquired whether we had in the x-ray or physical therapy departments anything that might help him in treating a serious case of gas gangrene. The patient was a young man who had injured his knee in an automobile accident. He was in his twenties and, though a very robust individual, surgical consultants had advised against operation because the disease had extended to the groin. The patient was delirious and any surgical procedure seemed out of the question. We replied that there was nothing definite that we knew of but suggested that since the patient could not be moved from his bed we might use the mobile x-ray unit. He gave us permission to treat the man by any method that we thought might be of value and we used the mobile unit and the technical factors shown in table 1.

To those accustomed to giving x-ray treatments this seemed like an awfully small dose when a depth factor was desired, but the response was so remarkable and the recovery so rapid that the incident remained in our memory and, in a few cases following this, similar treatment was given with the same startling results. In all, over a three year period, eight cases were treated which we shall call the first series. Table 2 shows the results obtained.

From the Department of Radiology, Creighton University School of Medicine.

Read before the Section on Radiology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

In the first series there were eight cases in which x-ray treatment and gas bacillus serum were given. In this series there were two deaths. Further analysis showed that both of these deaths occurred in the cases in which the trunk was involved. Recovery occurred in all six cases in which the extremities were involved.

The conclusions drawn after analyzing the results in the first series were that the x-rays were very probably

TABLE 1.—*Original Technic*

Mobile x-ray unit: 5-30 radiator type of tube
5 inch spark gap (approximately)
5 milliamperes
15 inch distance (approximately)
0.5 millimeter aluminum filter
3 minutes morning and evening for 3 days

TABLE 2.—*Results in First Series*

Series	Number of Cases	X-Rays	Serum	Extremity	Trunk	Living	Dead	Per Cent Dead
1	8	8	8					
				6		6	0	0
					2	0	2	100

of definite value in the treatment of gas bacillus infection when the extremity was involved but, since death occurred in both cases in which the trunk was involved, certainly there was no evidence of its value in these cases. However, realizing that we used a very low voltage type of radiation, we thought that by increasing the voltage and the depth dose we might be more successful in the future when the trunk was involved if we gave a heavier type of radiation. The recommendations we [1] made on reporting our first group of cases before the Radiological Society of North America in 1931 was that more cases be treated with x-rays when the opportunity presented and that if the trunk was involved the treatment given was to be with greater voltage and greater depth effect than that employed in our first series. After a period of three years during which time we treated two cases, one in which an extremity and one in which the trunk was involved, both patients living, we wrote letters to several colleagues who had treated cases and collected as much data as possible on their work. To our two cases we added thirty more by this method. These thirty, with our own two, we put into the second group of cases, which we shall term the second series.

In the second series, of thirty-two cases treated with the x-rays, serum was administered in only thirty cases. However, we were mainly anxious to know the effect of the x-rays in the trunk cases as compared with extremity cases, so we divided them accordingly. There were eight cases with trunk involvement and all eight patients lived, while of the twenty-four with extremity involvement five died. These results were somewhat contrary to the results in the first series. The results in the first series would lead us to believe that recovery should occur in all cases in which an extremity is involved and that death should occur in all trunk cases, while results in the second series would lead us to believe that recovery should occur in all the trunk cases and that death should occur in at least some of the extremity cases, since there were five deaths in this group.

1. Kelly, J. F.: The X-Ray as an Aid in the Treatment of Gas Gangrene, Radiology **20**: 296 (April) 1933.

Further analysis of the extremity cases in the second series brings out the facts shown in table 4; namely, that there were thirteen cases of the twenty-four in the extremity group in which amputation was not done and the thirteen patients lived, and out of the remaining eleven extremity cases in which amputation was done only six patients lived and five died. This table shows the high mortality in this group of cases.

The proportion dead in this small series who had amputation was 45 per cent. We then combined all the cases in the first and second series and they are shown in table 5. The figures in this table show the relative mortality in the trunk and extremity cases of the first two series of forty patients. The table shows ten trunk cases and thirty extremity cases. The two dead in the trunk group occurred in the first series and we believe that as far as x-ray therapy is considered the result may be attributed to inadequate treatment. The next fact evident is in the no amputation group, and this is indeed startling. In the extremity group of seventeen cases in which amputation was not performed there were no deaths, seventeen cases of gas bacillus infection with 100 per cent recovery. In the extremity group in which amputation was performed the result was not so good; there were thirteen cases with five deaths, or a mortality of 39 per cent, and this is about the usual mortality in other series reported in the literature.

The reason for the high mortality in the second series in the extremity cases led us to investigate the hospital records of the five patients who died and it brought to light the following facts:

1. The first man died two and a half hours after the ligature sloughed off a large vessel in the stump on the ninth day. He had apparently recovered from gas gangrene. This might be recorded as an accidental death.

2. The second man died of a pulmonary embolism on the twenty-third day, the embolism followed some repair work on the stump. He also had evidently recovered from gas gangrene.

TABLE 3.—*Results in Second Series*

Series	Number of Cases	X-Rays	Serum	Extremity	Trunk	Living	Dead	Per Cent Dead
2	32	32	30					
				24		19	5	20
					8	8	0	0

TABLE 4.—*Cases in Second Series in Which an Extremity Was Involved*

Series	Number of Cases	Extremity	No Amputation	Amputation	Living	Dead	Per Cent Dead
2	32	24					
			13		13	0	0
				11	6	5	45

3. The third man died on the third day after admission. He received only two x-ray treatments and failed to rally after an amputation. He had been severely injured. Shock was undoubtedly a factor in this man's death and he had insufficient x-rays to be properly considered as having had x-ray therapy.

4. The fourth man received 100 roentgens the first day and 90 roentgens the second day of his disease and no further x-ray treatment, dying on the fifth day, eight hours after an amputation. This was insufficient treatment; treatment should be given twice each day for at least three days.

5. The fifth man was one on whom the admittance diagnosis was diabetes mellitus with impending coma. He had a gas

bacillus infection in a diabetic ulcer. He died on the third day following an amputation, after receiving only two doses of x-rays. This also was not sufficient treatment. The postmortem showed extensive bronchopneumonia.

In a final analysis of these five deaths in the second series one might honestly eliminate two of the five cases in which death occurred, as far as gas bacillus infection as a cause of death is considered. For instance, the first man who died was one who died two and one-half hours after the ligature sloughed off a large vessel in a stump on the ninth day. He obviously bled to death after he had apparently recovered from the gas gangrene. The second man died of a pulmonary embolism on the twenty-third day. The embolism followed some repair work on the stump. He also had recovered from the gas gangrene. In the other three deaths in the amputation group gas gangrene cannot so easily be ruled out as a factor, and these three deaths with the two deaths in the trunk cases in the first series make a total of five deaths due to gas gangrene in the first and second series.

TABLE 5.—*Total Cases, First and Second Series*

Trunk Cases	No Amputation	Amputation	Living	Dead	Per Cent Dead
10	10	0	8	2	20
Extremity Cases	**No Amputation**	**Amputation**	**Living**	**Dead**	**Per Cent Dead**
30					
	17		17	0	0
		13	8	5	39

TABLE 6.—*Results in Third Series*

Series	Number of Cases	X-Rays	Serum
3	16	16	11
Extremity	**Trunk**	**Living**	**Dead**	**Per Cent Dead**
14		14	0	0
	2	2	0	0
No Serum	**Living**	**Dead**	**Per Cent Dead**
5	5	0	0

Encouraged by the results obtained using the x-rays as an aid in treating gas bacillus infection in the first two series, we decided to send a questionnaire to radiologists [2] and surgeons throughout the country who we thought might have had some experience with the work and in answer to this questionnaire we received data on sixteen additional cases. All the sixteen patients lived and this is the result that we hoped to attain at the time we reported our first series; namely, that others throughout the country would treat gas bacillus infection with the x-rays when the opportunity presented itself and by this means the results of the x-rays would more quickly be determined. We hope of course that the day will come when all patients with gas gangrene, when an adequate dosage of x-rays is used as an aid in treatment, will recover. We are encouraged to believe this is possible when we study the series of cases reported in answer to the questionnaire recently sent out.

2. For permission to include their cases and the assistance given through correspondence, the authors are indebted to Drs. J. J. Faust, Tyler, Texas; J. Philip Cogley, McMicken Hanchett and J. L. Stech, Council Bluffs, Iowa; Albert P. Condon, Charles Newell, Howard B. Hunt, H. F. Johnson, J. Dewey Bisgard, Roy W. Fouts, A. P. Overgaard, and E. A. Connolly, Omaha; E. A. Merritt and Isidore Lattman, Washington, D. C.; B. Weems Turner, Houston, Texas; L. A. Milkman, Scranton, Pa.; W. O. Squires, Coffeyville, Kan.; James T. Case, Chicago; Irvin P. Levi, Anniston, Ala.; Fred M. Hodges, Richmond, Va., and E. W. Rowe, Lincoln, Neb.

The results obtained in the third series are shown in table 6. All sixteen patients had x-ray treatments but only eleven had serum. All lived, so evidently the five in this group who received no serum recovered.

As regards the status of amputation, this series adds definitely to the opinion we have held for some time; namely, that it is an unnecessary therapeutic procedure. There were twelve patients who did not receive amputation, and all twelve lived. Two patients in the series received amputation and lived regardless of that fact (table 7).

In table 8 the mortality rate of the three series is compared. In the first series the death rate was 25 per cent. In the second series it was 9.3 per cent and in the third series it was 0 per cent.

The question of the use of serum is still undetermined. In the first series all patients received serum. In the second series two patients received no serum and recovered. In the third series five patients received no serum and recovered. Table 9 shows the total number of patients treated and the total number not receiving serum. All patients who did not receive serum lived. However, in spite of this we do not see fit to recommend the omission of the use of serum at this time. We also recommend the use of tetanus antitoxin, as tetanus developed later in one case in this series in which serum was omitted. The tetanus developed during the patient's convalescence after the gas bacillus infection had subsided. The patient also recovered from the tetanus (table 9).

With regard to amputation, we are very emphatic in our belief that amputation is not a therapeutic procedure for gas bacillus infection.

There were forty-four cases in which the extremity was involved. There were twenty-nine in which amputation was not performed and all twenty-nine patients lived. Out of the fifteen who had amputations, five died, a mortality of 33⅓ per cent. In these five we included the case in which the ligature sloughed off a large vessel on the ninth day following amputation and the case in which embolism occurred on the twenty-third day following recent repair of the stump. They are included in the amputation deaths but not included in the gas gangrene deaths, as the patient had evidently recovered from the gas bacillus infection (table 10).

TABLE 7.—*Status of Amputation*

Series	Number of Cases	Extremity	No Amputation	Amputation	Living	Dead	Per Cent Dead
3	16	14					
			12		12	0	0
				2	2	0	0

TABLE 8.—*Mortality Rate in Three Series*

Series	Number of Cases	Living	Dead	Per Cent Dead
1	8	6	2	25
2	32	27	3	9.3
3	16	16	0	0

In table 11 we have tabulated the mortality rate in the three series. Of fifty-six patients fifty-one lived; five died of gas bacillus infection, giving a mortality of 8.9 per cent. We feel that this mortality rate compares favorably with any series of gas bacillus cases so far reported in the literature.

We attempted to do some animal experimentation using guinea-pigs, but we could not determine anything to our satisfaction as it seemed to us that the pig is too small an animal to inject with the virulent gas gangrene and then attempt to cure it with the x-rays. If a real active strain of gas bacillus organisms was used it traveled so rapidly that it was soon necessary to treat most of the pig, and the combination of general body

TABLE 9.—*Use of Serum*

Series	Total Cases	X-Rays	Serum	No Serum	Living	Dead	Per Cent Dead
1, 2, 3	56	56	49	7	7	0	0

TABLE 10.—*Amputation*

Series	Total Cases	Extremity	No Amputation	Amputation	Living	Dead	Per Cent Dead
1, 2, 3	56	44					
			29		29	0	0
				15	10	5	33

TABLE 11.—*Percentage of Mortality in All Series*

Number of Cases	Living	Dead	Per Cent Dead
56	51	5	8.9

irradiation left too much undecided. Some pigs got well and some died and in the end we determined nothing. The question of the use of serum is also unanswered. At the time of our previous reports we recommended that gas gangrene serum be used and we still recommend that procedure, though there are several cases in these three series in which serum was not used and still recovery occurred. Probably some accurate experimental work on some suitable animals can answer the question of whether or not serum is required when x-rays are used.

In concluding, it seems fair to state that the x-rays up to this time seem to be definitely established as an aid in the treatment of gas gangrene both in extremity and in trunk cases, but it seems desirable to use serum and other measures and refrain from amputation until the patient has recovered from shock and from the gas bacillus infection. Amputation may then be necessary in a badly damaged extremity. In one case in our series this was done and gas gangrene recurred after the amputation. This area was immediately treated and the gas infection subsided. Since there is so much shock connected with amputation and furthermore since the diseased area is not all eliminated by some of these amputations, it again seems worth while to omit amputations as an obsolete therapeutic procedure for gas bacillus infection.

CONCLUSIONS

If one may be permitted to draw conclusions from such a small series of cases, it seems to be definitely certain that x-ray treatment is indicated in gas gangrene, both in extremity and in trunk cases; that the treatment should be started as soon as the disease is suspected and be given throughout its course, twice each day for at least three days.

Since infected tissue was left behind in many of the cases in which radical surgical operation was performed, it raises the question as to what good the surgery really does. Then the mortality of the patients operated on is so terribly high as compared to those not operated on that again the use of amputation seems to be a distinct disadvantage.

One child 11 and one 12 years of age in the second series recovered after losing an arm and both had active gas infection above the site of the amputation; so the disease was not all eradicated by surgical procedure. The children recovered in spite of amputations but lost an arm.

The dark appearance shown by the involved tissues does not indicate a true gangrene, and it clears up following successful irradiation. It is probably localized cyanosis.

One should not be discouraged and think the patient is beyond hope when one is first called on to treat him, as this work was started on material of that type, when the surgeon had his back to the wall, so to speak, when the case looked hopeless; in other words, the type of case all radiologists are quite familiar with in the inflammatory group.

X-RAY TECHNIC

The x-ray treatment should be given morning and evening over a period of at least three days and of sufficient voltage to insure penetration of the involved tissue: from 90 to 100 kilovolts on an extremity, 1 mm. aluminum filter, from 130 to 160 kilovolts on the trunk with increased filtration; about 100 roentgens per treatment over each area.

Finally: 1. Use x-rays in all cases.

2. Use serum unless there is some contraindication to the use of serum present.

3. Use tetanus antitoxin.

4. Use local surgical procedures and antiseptics as indicated.

5. Do not amputate for gas bacillus infection.

ABSTRACT OF DISCUSSION

DR. EDWARD H. SKINNER, Kansas City, Mo.: My experience has been limited to the diagnostic features of this condition. I know of only two cases in the last four or five years within this territory. This is a condition which automatically diagnoses itself, and if one does not know how to diagnose it early on the x-ray film, one certainly obtains gross postmortem evidence. The array of cases that Dr. Kelly has reported is most convincing. The interesting feature is Why are there so many cases in his territory? Rhinehart, with all the cases that he has diagnosed around Little Rock, has not treated any cases. He refused to open the discussion because he said he had never treated any cases. This situation seems to be somewhat unusual. With the sporadic appearances of these cases in certain areas and the almost epidemic appearance of them in other spots, it is probably not fair for the roentgenologist to assume too much responsibility.

DR. JOHN J. FAUST, Tyler, Texas: I wish to emphasize that the surgeon not only does not need to amputate, as Dr. Kelly has stated, early in the disease, but that the slashing of tissues for drainage is not indicated either, in spite of the teaching in the older textbooks. The blood supply to the area would be thus damaged, the infection spread and repair delayed. No longer is this infection an indication for an emergency operation. Cultures in my cases showed that not all of the gas-forming organisms are provided for in the serum prepared by Parke, Davis & Co., whose serum was used. Two of the cases in which cultures were taken were Bacillus claustridium-tertium infections. Since the serum was not for this organism it is possible that the x-ray therapy may have been entirely responsible for the cures. The serum was labeled as specific

for B. Welchii and Vibrion septique. It is obvious that a serum cannot be prepared to be effective against all of the gas-forming organisms. In two cases cultures were positive prior to the treatments, but cultures revealed no gas-forming organisms after the patients had been given x-ray treatments. I heartily agree with Dr. Kelly in urging that the treatment of patients be carried on regardless of how far the cases are advanced. I have been criticized for stating that a portable x-ray machine may do the work. This is a condition demanding urgent consideration, and time lost in calling for a radiologist from a distant city, as some one suggested, might be fatal. By actual calibration, Dr. Landauer, a physicist, found that a portable machine will deliver 45 roentgens per treatment. I am not certain that a heavier voltage is indicated. Frequent irradiation, at eight-hour intervals, maintaining more nearly a saturation dosage in the affected area, may be adequate. In view of the fact that one of my patients had both gas gangrene and tetanus in spite of the prophylactic dose he was given, one wonders whether the proper dose was given or whether a larger dose is not indicated in such cases.

DR. W. WARNER WATKINS, Phoenix, Ariz.: Because of my commenting at staff meetings of the hospitals in which I work on this work of Dr. Kelly's, one of our surgeons, in desperation, was induced to try this method. The case was an amputation not primarily for gas gangrene but for a serious crushing injury to the leg. The patient developed gas gangrene in the stump below the knee and it spread to the thigh as far as the hip. The surgeon remembered the comments and called for x-ray treatment. Two treatments were given and the effect was dramatic, with an immediate drop in temperature, no further extension of the gas infiltration, and a fairly prompt recovery. This surgeon has raised the question of treating all compound fractures with x-rays to prevent gas gangrene. I have not been able to say whether it might or might not prevent the development of gas bacilli in tissue. I should like to know what Dr. Kelly thinks about this.

DR. JAMES F. KELLY, Omaha: In answer to Dr. Skinner's question as to the epidemic feature of this disease in and about Omaha, I must call attention to the list of men who contributed to this series of cases, showing that they are from various parts of the country. Only about eight of these cases in a period of eight years are from my own service. Those who contributed are named in the paper. Concerning the question of diagnosis in Dr. Rhinehart's cases, since they all showed gas in the tissues and had clinical evidences of gas gangrene, they should be considered gas bacillus infections. I do not care to enter into the bacteriology of this disease because I do not know enough about it. If they have an infection with a gas-forming organism they should be treated. Concerning the question of Dr. Watkins as to the value of the x-rays in prophylaxis, I wish to state that one patient in this group received a treatment on admission to the hospital and one on the second day. No further x-ray treatment was given and he died on the fifth day. The x-rays did not prevent the disease in this case. I do not think the x-rays should be depended on as a prophylaxis but should be used throughout the active course of the disease. It was intended to go into the problem of prevention in guinea-pig experiments but we could not get results consistent enough to warrant any conclusions. It is helpful if one can get surgeons so enthusiastic that they will turn the cases over to the radiologist before the gas bacillus infection appears; then one can watch them, treat them earlier and have a better chance to cure them. The number of exposures necessary to cover the infected area varies, but all the involved tissue should be treated. At a distance of 15 inches one may not cover the entire field; if not, two or three exposures are made. The entire extremity should be treated.

Milk Fat.—The fat of milk is already emulsified and so is more readily available to the body than the fats of other common foods except eggs. But the outstanding nutritional advantage of milk fat over other common food fats is the association with it of the fat-soluble vitamins, particularly vitamin A.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

OSTEOMYELITIS AT COOK COUNTY HOSPITAL

WITH AN APPRAISAL OF ORR'S METHOD OF TREATMENT

MARCUS H. HOBART, M.D.
EVANSTON, ILL.
AND
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CHICAGO

At a meeting of the Chicago Orthopedic Club the winter of 1935 at which Dr. H. Winnett Orr spoke on his treatment of osteomyelitis, there was considerable discussion pro and con as to its value. Several different views were expressed. Some claimed unequaled good results with this method, others unrivaled poor results, stating that it was no better than other ways. As a consequence no definite conclusion could be reached.

It was determined, therefore, to review the record of cases of osteomyelitis treated by Orr's method in the orthopedic service at Cook County Hospital with the hope of throwing more light on the subject. Hence this compilation.

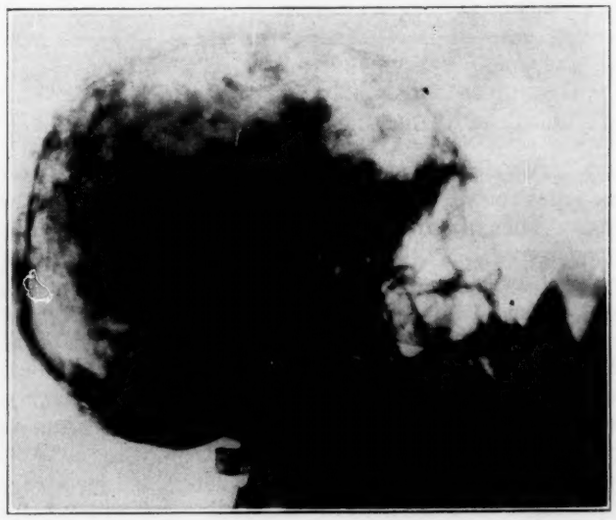


Fig. 1.—Syphilitic osteomyelitis of the skull.

The orthopedic service of Cook County Hospital is divided among six physicians. Most of the cases of chronic osteomyelitis, together with some of the acute ones, are sent to the orthopedic service, but occasional cases are treated in the general surgical services, of which there are about twenty-two. This discussion is confined to the orthopedic service, since it was felt that this was sufficiently diversified to give a rather general view.

As many of these patients comprise the ignorant poor, the disease often was neglected, so that the cases are apt to be as severe and hard to cure as could be found in any group throughout the country. Therefore, if these could be cured by any means, the results among private or educated patients should be better.

Then too, since there are six attending surgeons handling these cases, the personal variation of carrying out Orr's method should give an index to its general value.

From the surgical service of Northwestern University Medical School and of Cook County Hospital, Chicago.

Read before the Section on Orthopedic Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

There is an enormous amount of literature on the treatment and results of osteomyelitis. The various methods of treatment have all had their period of advocates with varying degrees of successes. The Orr method of treatment seems to have outlived the critical eye and is still the accepted method. The reader is referred to the articles by Orr [1] and Hey Groves.[2]

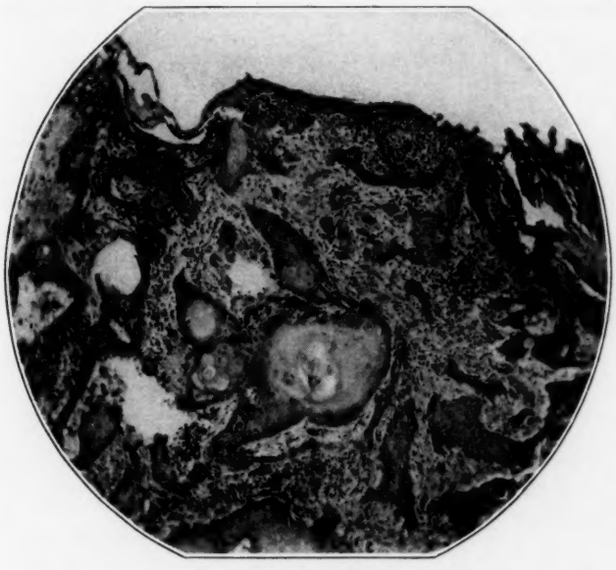


Fig. 2 (case 1).—Squamous cell carcinoma formed in osteomyelitic ulcer.

Although more than 375 patients have been operated on and asked to return for follow up, only one third have responded for a final check up. It may be assumed, therefore, that the majority of these patients may have become symptom free, and hence their absence. The cases reported here number 108, with 135 admittances to the hospital. The patients are referred to the outpatient orthopedic clinic from the examining rooms and consequently acute osteomyelitis is seen usually in the surgical wards as emergencies. Adults by far outnumber children, since the latter are admitted to the children's ward.

ETIOLOGY AND COURSE OF THE DISEASE

The greatest percentage of cases was directly due to trauma of one sort or another. It is obvious that industrial hazards and modern methods of conveyance still contribute to the majority of these cases. Contact osteomyelitis in spite of the careful work of Koch,[3] Mason [4] and others still remains an important etiologic factor in osteomyelitis. Direct surgical osteomyelitis cases following open reduction of fractures and the like reach a high percentage.

The usual course of the direct type of osteomyelitis is one having an uneventful period of convalescence, requiring one or, at the most, two operations for a cure. By this type is meant those cases of trauma following compound fractures, or direct implantations of bacteria following cuts and open wounds, frequently found in civic and industrial cases. No metastases have been seen following this type.

The patients with a hematogenous acute type follow a definite up and down course, are frequently readmitted for subacute inflammations of soft tissue and bone, and not infrequently remain invalids for life. Several cases have been seen in which the bones show extensive necrosis with bone abscesses but without a single complaint from the patient.

The extension form of osteomyelitis presents marked local manifestations with extensive bone necrosis and is frequently found in soft tissue infections of the hands.

The acute hematogenous type occurring in children is by far the most malignant in character, more toxic generally and recurs both locally and metastatically more often than the direct type. These patients return frequently, suffer skin infection and are subject by this chronic sepsis to anemia and amyloidosis. The contact osteomyelitis responds best to treatment, a thorough bone cleansing usually sufficing. The extension osteomyelitis is more disabling, requires soft tissue drainage and in many cases produces large massive bone necrosis.

Two cases of syphilitic osteomyelitis are reported, one involving the skull (fig. 1), the other the ankle. Both patients had draining sinuses with pain. Each case responded well to antisyphilitic treatment with potassium iodide and mercury.

The majority of cases in this group of 108 occurred in adults between the ages of 20 and 40. Those of children and preadolescents were seen infrequently because of treatment in other wards.

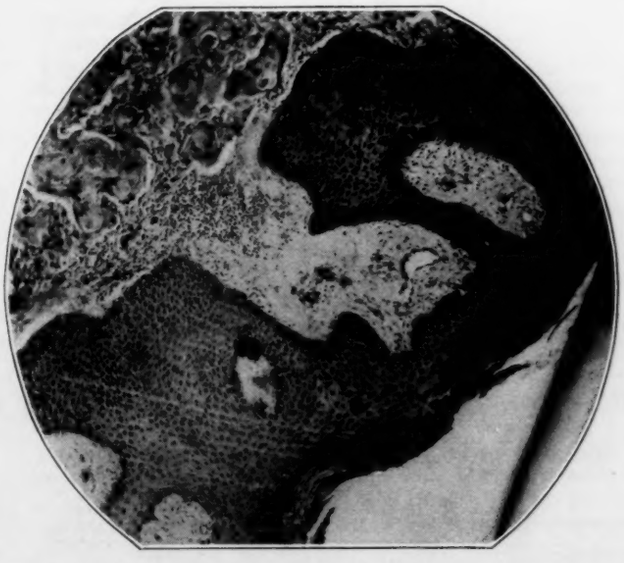


Fig. 3 (case 2).—Squamous cell carcinoma formed in osteomyelitic ulcer.

COMPLICATIONS AND SEQUELAE

As shown in table 2, complications are not as uncommon as was supposed. The three cases of squamous cell carcinoma arising from chronic osteomyelitis are important because radical treatment in the form of amputation seems to be the only method of choice. Two of these occurred in sinuses of one and one-half years' duration (figs. 2 and 3). The third occurred after a chronic draining sinus of forty years' duration

1. Orr, H. W.: A New Method of Treatment for Infections of Bone, Tr. Sect. Orthop. Surg. A. M. A., 1923, p. 138; Listerism, Am. J. Surg. **4**: 465-485 (May) 1928; The Treatment of Osteomyelitis and Other Infected Wounds by Drainage and Rest, Surg., Gynec. & Obst. **45**: 446-464 (Oct.) 1927; Osteomyelitis, in Cyclopedia of Medicine, Philadelphia, F. A. Davis Company; The Prevention of Accidents and Complications in the Course of Treatment in Chronic Osteomyelitis, read before the Section on Orthopedics at the Annual Meeting of Bristol Medical Association, Dublin, 1933.

2. Groves, E. W. H.: The Treatment of Infected Open Fractures, Brit. J. Surg. **18**: 294 (Oct.) 1930.

3. Koch, S. L.: Hand Infections, J. A. M. A. . **92**: 1171 (April 6) 1929. Koch, S. L., and Kanavel, A. B., in Graham's Surgical Diagnosis, Philadelphia, W. B. Saunders Company **1**: 457, 1930. Koch, S. L.: J. Indiana M. A. **22**: 510 (Dec.) 1929.

4. Mason, M. L., and Koch, S. L.: Surg. Gynec. & Obst. **51**: 519 (Nov.) 1930.

(fig. 4). It would seem, therefore, that chronicity of drainage with irritation to epithelial proliferation, as Brunschwig [5] brings out, is not the primary cause but rather a constitutional diathesis of some sort. The type of malignancy reported in all three cases is that of a hornifying squamous cell carcinoma.

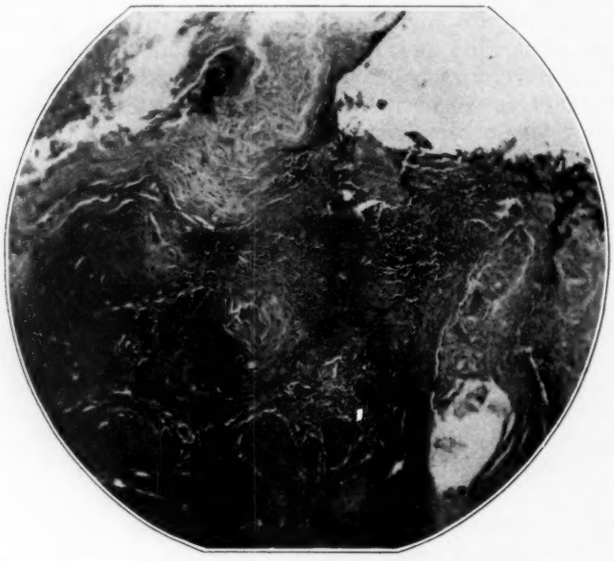


Fig. 4 (case 3).—Squamous cell carcinoma formed in osteomyelitic ulcer.

The second group of complications was that of bilateral toxic neuritis of the eighth nerve occurring in two male patients, one 16 and the other 17 years of age. These two patients had hematogenous generalized

TABLE 1.—*Orr Treatment or Modification in Series of 108 Cases of Osteomyelitis*

	Orr Treatment				Modifications of Orr Treatment, 13%	
	Favorable Results, 62%	Undetermined, 4%	Unfavorable Results, 21%		Favorable, 12.5%; Unfavorable, 87.5%	
Bone Involved	Number		Number	Comment	Number	Comment
Tibia	19	4	14	Still draining; only 2 with pain	3	No cast used; drainage not thorough
Femur	9	..	4	1 death (sepsis); 3 still draining	3	No cast used
Hip joint	3	..	2	Still draining	..	
Humerus	3	..	1	Pain; no drainage	..	
Hand						
Phalanx	4	..	..		..	
Metacarpal	1	..	..		..	
Elbow joint	2	..	..		..	
Scapula	1	..	..		1	Excellent result; no cast used
Fibula	4	..	1	Still draining	..	
Knee	1	..	..		..	
Ulna	3	1	..		1	Drainage; no cast used
Foot						
Metatarsal	4	..	..		..	
Calcaneus	2	..	..		3	1 excellent result 2 draining; no cast used
Knee joint	6	..	..		3	Still draining; no cast used
Clavicle	2	..	..		..	
Radius	1	..	..		..	
Shoulder joint	..	..	..		1	Pain present; no cast used
Total	65	5	22		16	

osteomyelitis, deafness occurring rather suddenly from six months to one year after the bone infection.

The third group of complications is that of pathologic fractures, two in number. One occurred after neglect of treatment in a woman aged 50, in whom an acute suppurative arthritis developed; with indifferent conservative treatment, a fracture developed at the lower third of the humerus. The second patient, a man aged 43, developed a rather sudden hip condition, following tonsillitis, and two weeks afterward fractured the neck of the femur. The fourth complication was a case of toxic encephalitis, in a child aged 9 years, simulating a brain abscess. The abscess was drained through a subtemporal decompression. An uneventful recovery ensued. The patient is at present symptom free both from the bone infection and from the cerebral involvement.

TABLE 2.—*Complications and Sequelae of Cases Reported (108)*

Type	No.	Age	Etiology	Duration Before Diagnosis	Result	Per Cent of Total
Malignancy from osteomyelitis	1	54	Idiopathic	1 yr.	Amputation	2.6
	2	51	Idiopathic	1½ yrs.	Amputation	
	3	73	Hematogenous	40 yrs.	Died	
Toxic neuritis, 8th nerve	4	15	Hematogenous	6 mo.	Bilateral deafness	1.9
	5	16	Hematogenous	1 yr.	Bilateral deafness	
Pathologic fractures	6	41	Hematogenous	2 wks.(?)	Symptom free (healed)	1.9
Toxic encephalitis	7	50	Hematogenous	9 mos.	Undetermined	
	8	10	Hematogenous	1 wk.	Symptom free (subtemporal decomp.)	0.96

TECHNIC OF TREATMENT

We have attempted to follow Orr's dictum of treatment with proper drainage and rest. The cases of fever, pain and roentgenologic evidence of infection are opened widely and debrided, but cautiously (fig. 5), with an attempt to prevent further extension into normal bone. At times the cavity is swabbed with iodine and alcohol. Petrolatum packs are inserted loosely and a cast is applied. The cast is left on until healing occurs but occasionally is replaced by a new one. The outer dressings may be changed, but the petrolatum

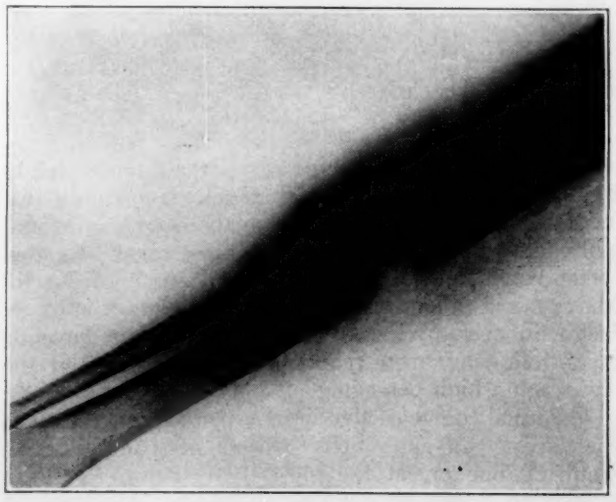


Fig. 5.—Nonunion of tibia following débridement of osteomyelitis.

pack is allowed to remain for four weeks, when it is removed carefully and a new petrolatum pack inserted. This is done to prevent the gauze from adhering to the wound. In recurrent cases with discharge, but without pain, more conservative methods are used and sequestrums are removed only under roentgenologic evidence. Sinuses of soft tissues are curetted and allowed to heal from the bottom. Brodie's abscesses are opened, normal bone being spared as much as

5. Brunschwig, Alexander: Epithelization of Chronic Osteomyelitis Cavities: A Precancerous Lesion, Radiology **24**: 627 (May) 1935.

possible. Very conservative measures are used to remove infected bone in cases of extension osteomyelitis of the hand.

COMMENT

Although the number of reported cases is relatively small, the results of this method are extremely gratifying. It is difficult to judge the healing powers of the various bones, the period of convalescence in healing and the general response of the patient because of the variability of the technic, the period of operability and the virulence of the organisms in the production of osteomyelitis. All that can be said is that this method has given 62 per cent symptom-free cases (table 1). Twenty-one per cent of cases treated by the Orr method failed to heal to date. Those cases treated by some modification of this treatment, i. e., without cast or without packing, gave 12.5 per cent of cures in the sixteen cases reported.

CONCLUSIONS

1. The Orr method of treatment still remains the treatment of choice for osteomyelitis.

2. Hematogenous osteomyelitis shows no great advancement of cures, whereas direct osteomyelitis responds well to direct, thorough, bone osteotomy under proper conditions. Extension osteomyelitis still remains a problem of the general surgeon and, with the proper treatment of infections, osteomyelitis should be reduced.

3. Complications in this series are large. Three cases of malignancy of soft tissue (2.6 per cent), two cases of toxic neuritis of the eighth nerve (1.9 per cent), two pathologic fractures (1.9 per cent) and one case of toxic encephalitis (0.96 per cent) occurred in this series of 108 cases.

636 Church Street.

ABSTRACT OF DISCUSSION

DR. R. J. DITTRICH, Fort Scott, Kan.: From an analysis of the pathologic changes seen in osteomyelitis and the course of the disease, it is noted that there are a large number of variable factors which make the disease complex and the outcome uncertain. The most important feature in the treatment is adequate drainage and this, together with immobilization in plaster casts, constitutes a method of treatment that is sound in surgical principle and consistent with ideas of infection in general. It may be said that no method of treatment is fool proof, yet a strict adherence to the principles advocated by Orr will yield a high percentage of satisfactory results. It has been my experience to see more frequently local recurrences in healed lesions and metastases in other portions of the skeleton. There is no way by which these conditions can be foreseen or avoided. However, it is hoped that some method of immunologic therapy may be developed by which these complications can be effectively prevented and the morbidity of the disease thereby minimized.

DR. JACOB KULOWSKI, St. Joseph, Mo.: My recent report, from Steindler's clinic, includes 323 cases treated by the Orr method, in 65 per cent of which healing had occurred up to the time of this investigation, with a general mortality of less than 3 per cent. Twenty per cent of the patients were still under treatment, about 2 per cent required amputation, and the result was unknown in about 11 per cent. In an earlier paper it was shown that the average period of convalescence until healing occurred was dependent on the following factors: In general, lesions treated primarily or initially by this method averaged six months; those treated secondarily (after some other form of treatment had been instituted), nine months. Foci in the upper extremities healed in six and one-half months, as against nine months for foci in the lower extremities. Lesions complicated by sequestrum or sinus formation, as well as infected compound fractures, healed in ten months. The most stubborn group showed a mixed bacterial infection and required almost fifteen months. In this smaller series healing occurred in more than 76 per cent of the cases. The vast majority of these cases were in the subacute and chronic stages. There is more or less general agreement regarding the Orr method in these stages of the disease. Argument and some confusion continues relative to the acute hematogenous lesions. The pendulum is swinging toward conservatism in degree. It is helpful to remember that surgical intervention is not indicated until there is definite local evidence of suppuration. Perhaps early diagnosis and immediate drainage have been overemphasized at the expense of a careful evaluation of the surgical risk. The fault rests with the individual surgeon and not with this method. Common sense neglect of generally accepted preoperative rules of procedure reflects unfairly on and discredits sound axiomatic surgical principles of drainage. However, it is also true that the conservative postoperative technic of the Orr method allows more extensive surgery in the acute stages, in properly selected cases, than would otherwise be feasible. The Orr method meets all the therapeutic requirements presented by a disease in which chronicity and its attendant devastating sequels was formerly inevitable in about 80 per cent of survivors. This standardized universal method, suitable to the rank and file of physicians, can combat a disease so apparently contradictory and variable in its clinical and pathologic manifestations. The entire clinical life history of the disease has been finally reflected in its complications, which predominated the picture until more recent times. Now the dovetailedness of its phenomena is clearly evident, since the vast majority of sequels are dependent on the local skeletal situation. From this perspective there is a clinical harmony on the basis of which the Orr method was evolved and on which it must stand or fall; namely, the primary and secondary control of the disease.

DR. J. E. M. THOMSON, Lincoln, Neb.: The Orr method fulfils the requirements that have been outlined by most writers on this subject better than any other that I have been able to try; and I had my fling during the war at the Carrel-Dakin method, later at various antiseptic packs and dressings, and more recently at maggot traps, only to swing back to the petrolatum pack. The method, from a practical standpoint, offers the patient more comfort during his period of convalescence and gives the physician or surgeon less anxiety and demands less labor in his care of the patient. Lastly, it is far more economical for the patient and also for the hospital, in the way of supplies and equipment, in spite of the fact that one is often embarrassed by the fragrance that emanates from these cases, which, after all, is far more distressing to the friends and relatives than it is to the patient himself. I am aware of the fact that a great many of these compound fractures and open wounds can be cleaned up thoroughly and closed and that they will heal by first intention. It hardly seems necessary to prolong convalescence by putting in a petrolatum pack in every one of these cases, because, should infection develop and the symptoms so indicate, the wound could be opened and the Orr method applied. There are several rather interesting things about this paper that impressed me. First: In making an assumption one should be very careful and have it well founded. For instance, simply because of the fact that of the one third of the entire group of patients who came in for check up there were 62 per cent healed and symptom free, it would seem preposterous to assume that the other two thirds were cured. On the other hand, had two thirds of the entire group come in for check up and been found symptom free, one might be willing to assume that the other third at least had as good a break as the two thirds who came in. I am sure that the authors did not wish to be misleading in this statement, and I mention the fact only in order that a correction may be made. Perhaps the most important feature of this paper was the fact that it called attention to the frequency of complications in osteomyelitis. To think of 7.36, or almost 7.5 per cent, of osteomyelitic patients having complications seems rather high, particularly in private practice. However, one should be apprehensive of these complications and ready to meet these problems as they arise. Lastly, I think that the authors' deduction with respect to the fact that direct osteomyelitis healed more readily by the Orr method than did the hematogenous type is correct. This gives a basis by which one may make a prognosis in these cases that will have more chance of healing by the Orr method and gives an opportunity to judge what the outcome is going to be.

DR. EDWIN W. RYERSON, Chicago: I read in the program "A Report of Five Hundred Cases Treated by the Orr Method." What it boils down to is a report of about 125, and I think that is a little misleading.

DR. JOHN PRENTISS LORD, Omaha: I learned the first principles in the treatment of osteomyelitis under Dr. Moses Gunn as early as 1880. He taught that wide incision, adequate removal of the disease, and packing the cavity with crystals of boric acid cured a large proportion of the cases. From 1893 I practiced general surgery exclusively until 1922. In those earlier days the general surgeons handled osteomyelitis. I followed the principles learned from Gunn in securing early, adequate, maintained drainage. In the early years of the Nebraska State Orthopedic Hospital, as chief surgeon for a number of years, with Dr. Orr as associate, I had many old, neglected, extreme cases of osteomyelitis in children. We found that in removing the gauze packings, then in general use, there was an elevation of temperature after every dressing and it took a day or two or three for these temperatures to return to normal. The question was What could we do to avoid this? I had been dabbling with Beck's paste. I had an adverse reaction against Beck's paste. Then there were some who injected petrolatum, undertaking to cure chronic sinus involvement in the same way—a failure, of course, because unsurgical. I devised a means of pouring these gutters, mostly in shin bones, with petrolatum, covering with gutta percha tissue and allowing the discharge to find its ways out from its edges. That unfavorable experience following the gauze dressings was eliminated, and they pursued a smooth course. In later years Dr. Orr amplified this petrolatum treatment. Indeed, he must be given credit for having established a system that has been very successful, perhaps on a par with any other. Having been a general surgeon, however, with the general surgeon's psychology, I had somewhat of an adverse reaction against treating all my osteomyelitis cases with petrolatum. In selected cases I did use it, but I sought to eliminate the major unpleasant, objectionable feature the odor. I melted petrolatum with 10 or 11 per cent of paraffin and used mostly boric acid petrolatum, believing that it would stimulate granulations. I held this plug in with paraffin-linen mesh, strapped on with adhesive plaster. As this soft material would exude through the mesh as the cavity became smaller, it was scraped off with a sterile spatula and the wound margins were painted with mercurochrome, because iodine smarts. The gauze pads were changed often. We didn't have the stench, and we didn't have to move these patients out on the porch or out into the orchard. By changing the pads as indicated extravasation of discharges into the dressings or into the plaster was thus prevented and the very objectionable odor greatly minimized. Operators desiring to continue the petrolatum treatment may wish to accept this suggestion of mine.

DR. MARCUS H. HOBART, Evanston, Ill.: Dr. Kulowski's figures agreed pretty well with ours, 65 per cent of cure in cases of osteomyelitis treated by this method. I agree with Dr. Thomson that the use of the petrolatum treatment in compound fractures seems unnecessary. The compound fracture can be opened later if infection is superimposed. As to assuming that the 200-odd cases that we didn't report were cured, I said at the beginning of the paper that a person might assume that they were cured, but they were not included in the 108 cases in the statistics that we compiled. As to Dr. Ryerson's remarks on the 500 cases, I think that they are very well taken. Five hundred was the general impression that we had at first of the number of cases. When we got the compilation we found that there weren't that many, and an attempt was made to correct the title. I apologize for that title. It has been worrying me ever since it came out. As to Dr. Lord's treatment, early, adequate drainage, I believe, is one of the primary and most important parts of this treatment, and it is perhaps the thing that allows the condition to clear up. In the letters that we sent out, five out of six of the attending men were unanimously in favor of Orr's method for the treatment of osteomyelitis. I may say that ten years ago when we started on the service, we hated to see a case of osteomyelitis come in, because we felt "once osteomyelitis, always osteomyelitis." We feel that, with the Orr method of treatment, we can get at least 62 per cent of cures.

RESTORATION OF THE ORBIT AND REPAIR OF CONJUNCTIVAL DEFECTS

WITH GRAFTS FROM THE PREPUCE AND LABIA MINORA

GRADY E. CLAY, M.D.
AND
J. MASON BAIRD, M.D.
ATLANTA, GA.

Grafts from the prepuce and labia minora have not heretofore been used for conjunctival grafts and it is the ideal tissue as a substitute for conjunctiva. There is plenty of tissue available for such grafts and it has all the appearance of perfectly normal conjunctiva a very short time after it has been grafted. The graft from this source is very thin and contains no hairs and very little subcutaneous fat. It has a pinkish color and can easily be cut to fit the area desired.

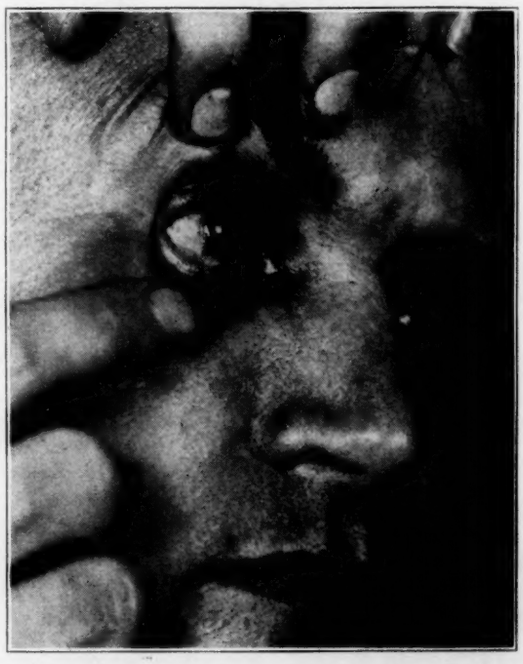


Fig. 1.—Tumor, recurrent after second surgical removal, before conjunctival graft.

Skin grafts used in restoring conjunctival defects have been successful but are most unsatisfactory to the patient in that they are uncomfortable and unsightly, desquamation is always present, and there is most frequently a disagreeable odor. For those reasons this new type of graft seems to be an ideal substitute for the conjunctiva.

In the correction of symblepharon and the removal of large growths from the conjunctiva for which grafts are necessary, grafts from the prepuce and labia minora are ideal because they have the appearance of conjunctiva and do not desquamate. Grafts for such defects are cut slightly larger than the area to be covered and then, with very fine silk, are carefully sutured in place. The conjunctival sac is then filled with boric acid ointment and a pad applied with not too much pressure. This is allowed to remain for three days; the dressing is then changed daily, the sutures are removed on the fifth day, and the pad is removed after one week.

Read before the Section on Ophthalmology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

In restoration of the socket, the socket is opened and prepared in the usual manner and the graft is cut and shaped to fit the socket. Plenty of fine silk sutures should be placed at the margins of the lid and the graft placed in position, two double armed sutures being placed through the upper lid to hold the graft smoothly against the tarsus and the same sutures placed through the lower lid, the sutures being tied on the surface of the skin. The socket should be well dilated and kept so for two weeks if an artificial eye is to be worn successfully afterward. For that purpose an artificial eye with a glass ball cemented to the back of the eye best fills out the socket. This is placed in the socket with plenty of boric acid ointment, the lids are kept sutured, a pad is applied with pressure and left for four days, and thereafter daily dressings with slight pressure are applied. The lids should then be separated at the end of two weeks and an artificial eye should be inserted at once.

The mucous membrane of the vestibule of the vagina (between the inner margins of the labia minora and the outer margin of the hymen) is smooth, glistening and devoid of glands and of hair follicles. Such a graft is easily obtained from this region of the female external genitalia, and subsequent healing leaves no deformity.

The field of operation is prepared with soap, water, and a solution consisting of equal parts of acetone, 5 per cent mercurochrome and alcohol. A quadrilateral incision is made within the vestibule between the inner margin of the labia minora and the edge of the hymen. The upper transverse incision is made at about the level of the upper margin of the vagina and the lower transverse incision well down near the center of the fossa navicularis. Two vertical incisions, one near the inner margin of the labia minora and the other along the

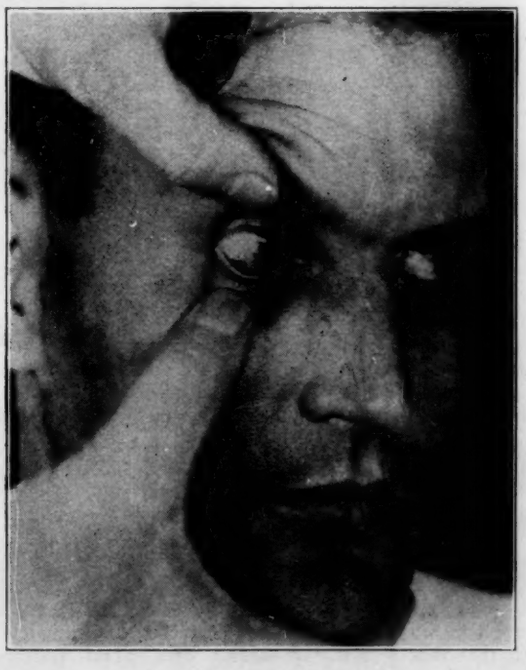


Fig. 2.—Appearance after graft.

outer edge of the hymen, complete the quadrangle. In this way a strip of mucous membrane, approximately 3 by 5 cm. in diameter, is easily obtained. There is very little bleeding at the site of the graft. The incision is closed with interrupted sutures of zero plain catgut. If necessary, a similar graft may be obtained on the opposite side. Healing in the cases done was by primary union without any deformity of the external genitalia. The skin from the prepuce is obtained by a circumcision, special care being used in the preparation, and as much as possible of the inner surface being employed, for here the skin is much more like mucous membrane.

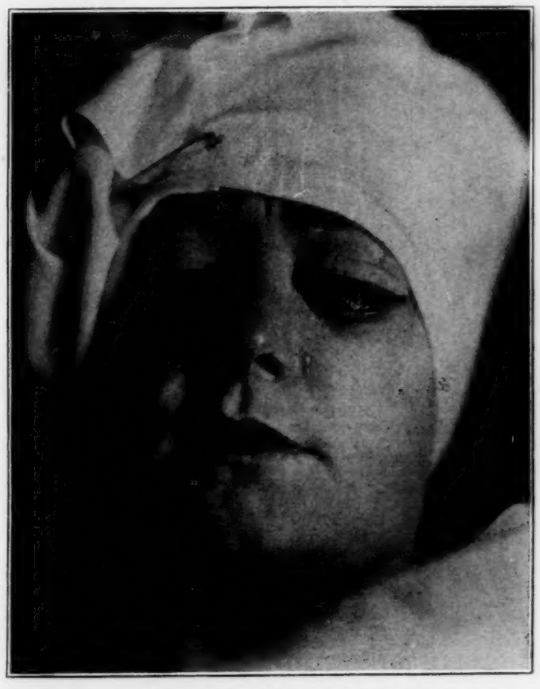


Fig. 3.—Eye before surgical removal of hemangioma.

In the reports of two cases, the first demonstrates the conjunctival graft and the other the restoration of the socket.

CASE 1.—P. H., a healthy man, aged 35, first seen in June 1931 at the Steiner Clinic of Grady Hospital, had had a small tumor on the right eye at the outer canthus two years before. It had been removed surgically twice during that period, the last time being six months previously, and had recurred with much more rapid growth. Examination showed a large tumor of the ocular conjunctiva at the outer canthus, which was slightly elevated and about 6 mm. in diameter and extended across the limbus for about 1 mm. The tumor seemed to be slightly attached to the sclera, as it was not movable. The tumor was very vascular but not pigmented. A diagnosis of carcinoma was made and enucleation was advised, which the patient refused. One week later the tumor was removed and was found to be very adherent to the cornea and sclera near the limbus, but there was such a large denuded area that it was difficult to cover it with conjunctiva. This was done, however, and radium needles were planted under the conjunctiva and removed four hours later. The following day there was a sloughing of the conjunctiva and superficial layers of the sclera; this area, 7 mm. in diameter, remained as such. July 9 the graft from the foreskin was used and sutured in place; the eye was filled with boric acid ointment and dressed on the second day. At the first dressing there was very little discharge and the graft seemed to be taking perfectly. On the fifth day the graft had a good color, the sutures were removed and on the seventh day the pad was removed with a perfect take of the graft, as shown in figure 2. The patient was last seen in April 1936 with no evidence of return of the tumor and suffering no discomfort from the graft. The use of radium produced a severe keratitis near the limbus which has given some trouble since, but there has been no discomfort from the graft.

The pathologic report by Dr. E. L. Bishop, pathologist of Steiner Clinic, stated that sections showed sheets of partly hornified epithelial cells with pearls and spines. The cells were hyperchromatic and fused together. In one area the cells were much smaller and very hyperchromatic, and almost spindle

shaped. Mitoses were not especially numerous. There was evidence of moderate infection, with a little connective tissue stroma and numerous lymphocytes.

The diagnosis was epidermoid carcinoma, grade 2, moderately sensitive in some portions.

CASE 2.—Miss C. H., aged 22, was seen Jan. 13, 1933. At the age of 2 years a small reddish growth was noticed on the

Fig. 4.—Appearance after removal of tumor.

ball and lower lid. This gradually increased in size so that at the age of 15 the lower lid was markedly swollen and the eyeball was proptosed. A tumor was removed at that time by a local surgeon. Following this the tumor did not reappear until five years before the present admission, and then the swelling of the lower lid began to occur and gradually grew with an

Fig. 5.—Socket after restoration by labial graft.

increasing proptosis. Examination revealed a marked proptosis of the left eye; the ocular conjunctiva, especially at the limbus below, was swollen and a dark red. This was true of all the conjunctiva below and of the lower lid. The lower lid was markedly swollen and a tumor mass was easily felt. August 14, under surgical anesthesia, an attempt was made to remove the tumor, which was diagnosed as hemangioma. An incision was made parallel to the border of the lid near the margin of the orbit below, and the tumor, which filled the lower orbit, dissected out. The conjunctiva from the lower lid and part of the ocular conjunctiva were cut away with the diathermy current and the lower lid was allowed to become adherent to the eyeball. Figure 3 shows the tumor before operation. The result of the operation was striking, as shown in figure 4, but the eye was not freely movable, owing to the adhesion of the lower lid to the eyeball, and closure of the lids was not perfect. An exposure keratitis began to develop and a few months later the ocular conjunctiva nasally and above became involved in the tumor mass; radiation was used during this period with no reduction in the size of the mass but with loss of lashes and retraction of the upper lid, and by August 1934 the eye became so uncomfortable that enucleation was necessary. When the eyeball was removed it was necessary to remove all the remaining conjunctiva, since it was involved in the original tumor; the lids, of course, became adherent and there was no remnant of a socket.

July 9, 1935, the restoration of the socket with the mucous membrane from the labia minora was attempted. The socket was freed and dissected of any scar tissue, and Dr. W. R.

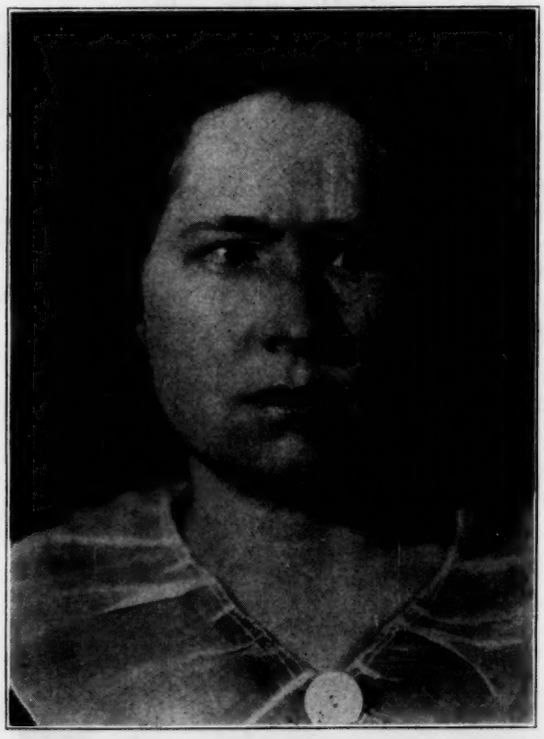


Fig. 6.—Artificial eye in reformed socket.

Holmes dissected the graft from the vagina, giving us a graft 1 inch (2.5 cm.) wide and 2 inches (5 cm.) long, stating at the time that more tissue was available. This graft was very thin and had no subcutaneous fat. It was carefully sutured to the lid margins above and below, and at the inner and outer canthus a ball was inserted with much boric acid ointment. The lids were sutured together and a pressure bandage was applied. The socket was not dressed for three days. At the first dressing there was only a slight discharge, the lids had separated except for the central area, which was left, and daily dressing of boric acid solution was used. Slight pressure was kept up for ten days, at which time the lids were separated and the ball was removed. The graft made a complete take and at that time had the appearance of a normal conjunctival socket. The socket after one month did not contract, since a ball was kept in place, but not enough culdesac was present below to permit the wearing of an artificial eye. September 8 a similar graft was obtained from the opposite side of the vagina and it was placed below. An incision was made along the lid margin below and the mucous membrane was pushed back, the lower lid was dissected up and the graft was sutured to the lid border and mucous membrane; the dressings were the same as in the previous operation. On the tenth day the graft had

made a perfect take; figures 5 and 6 show the socket, which has all the appearance of a normal conjunctival socket. There has been no discomfort or discharge, and there is no deformity of the vagina.

CONCLUSION

Tissue from the prepuce and labia minora are ideal for all conjunctival grafts, and enough tissue is available for the complete restoration of the socket. Such tissue has none of the objectionable features of ordinary skin grafts.

384 Peachtree Street.

Clinical Notes, Suggestions and New Instruments

BRINGING OUTSIDE AIR INSIDE

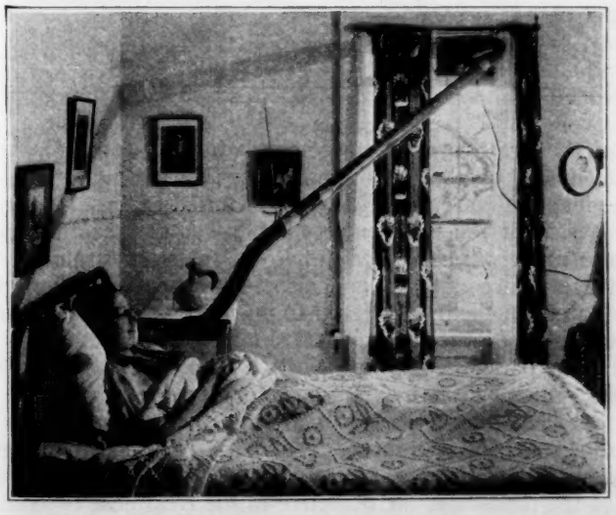
AN INEXPENSIVE SUBSTITUTE FOR OXYGEN THERAPY

J. E. CREWE, M.D., ROCHESTER, MINN.

For many years, in cases of pneumonia or tuberculosis, and in a few cases of advanced cardiac diseases, I have used with excellent results the apparatus that is here described. The apparatus consists essentially of a small blower and a pipe about 2 inches in diameter. The blower is attached to an aperture in a board of adjustable length, so made that it can be fitted beneath a raised window. The pipe extends from the blower to near the patient's face. The middle portion of the pipe is rigid but can be made of adjustable length. To this portion of the pipe is attached a cord and counterweight. The cord runs through a hook or pulley that can be screwed into the ceiling or into an overhead frame. The ends of the pipe are flexible. Thus, the pipe can be hung in any convenient position.

The purpose of the apparatus, obviously, is to supply gently moving outdoor air directly to the patient. In extremely cold weather the patient's chest is adequately protected and sometimes a woolen cap is worn; but it is rare for patients to complain of the cold air. They obtain so much relief from it that they object to having the air supply discontinued.

The chief advantage of the apparatus is that it can be used where oxygen is not available because of problems of transportation or of expense. The other advantage is that the atmosphere in the patient's room can be kept at a comfortable temperature and he lies or sits with his movements unhampered by heavy bed clothes or a tent. Moreover, it is sad to say that in many dwellings of our country the patient does not have a room to himself. In fact, often a large family must live in one or two rooms. In such cases the atmosphere of the room must be kept warm in winter and is vitiated by heating stoves and by the breathing of other members of the family.



The apparatus in use in a home.

Those physicians who practice in rural districts which have been hard hit in recent years will appreciate the circumstances which first suggested to me an apparatus of the sort that has been described. I was called to see a child, aged 5 years, who had pneumonia. The child was cyanotic and the air in the small, tightly closed house was very bad because of the crowded condition of the house and the fumes from a kerosene stove. The outdoor temperature was —20 F. I asked the father to find, if possible, a piece of 3 or 4 inch pipe. He was fortunate in finding an old boiler flue about 7 feet long. A hole, large enough to admit the pipe, was cut in a board and the board was fitted snugly into a partly opened window. The cold air rushed in and almost at once the cyanosis disappeared. The simple apparatus was used until the child recovered.

Since then, on occasions, I have reverted to this crude apparatus; for instance, in homes where electricity has not been available to operate the blower, I have used rain spout or any other pipe that could be procured and have fitted elbows to the external end of the pipe to catch the prevailing wind.

In one case, during an extremely hot spell, a patient, aged 75 years, who had pneumonia, was experiencing great difficulty in breathing. With all windows open and several fans running, he was not relieved. The pipe was attached to a window, all other windows were closed, and a spray from a garden hose was directed past the inlet of the pipe. At once the breeze of cool, moist, outdoor air that was directed near the patient's face gave much relief from air hunger. After that experience I attached to the inlet of the pipe an automobile hot water heater and caused cold water to circulate through it.

Considerable experience over many years has convinced me that, by the methods described, most patients can be given all the oxygen they require, in nature's own mixture. Recently the appartus was exhibited at the meeting of the Minnesota State Medical Association and attracted favorable interest, particularly among rural practitioners.

11 First Street, Southwest.

ACUTE BRUCELLOSIS

DEATH FROM PULMONARY EMBOLISM

WILLIAM R. BAGLEY, M.D.; SELMA C. MUELLER, M.D., AND ARTHUR H. WELLS, M.D., DULUTH, MINN.

Infections with Brucella organisms are being more frequently diagnosed in recent years than formerly, and the clinical and pathologic aspects of the disease are more widely recognized. The old names "undulant fever" and "Malta fever" are giving way to the more scientific term "brucellosis,"[1] mainly because the clinical syndromes of the three causative organisms, Brucella abortus, suis and melitensis, cannot be differentiated. Although patients having the disease usually recover, an occasional one succumbs. We are reporting here a case of Brucellosis having the unusual occurrence of fatal pulmonary embolism.

REPORT OF CASE

A white man, aged 46, an urban laborer, presented himself for examination because of progressive weakness and cough of three months' duration. The cough was unproductive. His appetite had failed and he had suffered from constipation since the onset of the malaise. He believed that he had been having fever a good share of the time, but he had continued to work in spite of marked exhaustion. The past history revealed nothing of note except an appendectomy nineteen years before and "gravel" in the right kidney following that.

The patient was well developed and seemed quite comfortable. The only physical phenomena of note were a temperature of 101.6 F., pulse 80, blood pressure 108 systolic and 65 diastolic, marked oral sepsis, and chronically infected tonsils. Laboratory examination revealed a hemoglobin of 76 per cent, 3,930,000 red blood cells and 5,500 white blood cells, of which 59 per cent were polymorphonuclear cells, 40 per cent lymphocytes and 1 per cent basophils. The patient's blood serum agglutinated Brucella melitensis (abortus) antigen in a dilution of 1:320 on first examination and later in a dilution of 1:1,280. Blood cultures subsequently showed growth of Brucella abortus, apparently of the bovine type.

During his stay in the hospital the patient's temperature ranged from 100 to 104, occasionally dropping to 99. He per-

1. Evans, Alice: Chronic Brucellosis, J. A. M. A. **103**: 665 (Sept. 1) 1934.

spired profusely, soaking the bedclothes several times each night. On the fourth day of hospitalization, three teeth were extracted under local anesthesia, followed by some rise in temperature. On the eleventh and twenty-third days of his hospital stay, 50 cc. of whole blood from a brucellosis convalescent was injected intramuscularly. The patient seemed to be slightly improved for a few days, but his temperature still rose to between 101 and 102 each afternoon. On the twenty-fifth day of hospitalization he complained of a pain in the left thigh at 5 p. m. At 9:25 he suddenly experienced a severe pain in the left leg followed shortly by pain in the precordium, cyanosis and dyspnea. In spite of stimulants, nasal oxygen and artificial respiration, he died at 9:45 p. m.

At necropsy an antemortem clot 8 cm. in length was found plugging the left pulmonary artery, and several fragments of the same clot were present in the right pulmonary artery. In the left femoral vein, 4 cm. below Poupart's ligament, remains of a thrombus were found. Both iliac and femoral veins showed smooth, noninjected internal surfaces free from inflammatory changes. Microscopic sections of the embolus showed the characteristic architecture of an antemortem thrombus entirely free from unusual inflammatory elements.

There were evidences of an active toxic or inflammatory process widespread through the internal organs. The posterior portions of both lungs showed a moderate diffuse congestion with frequent scattered neutrophils in the interstitial tissues and many pigment-laden phagocytes in the alveoli. The 2,400 Gm. liver showed a moderate diffuse neutrophilic infiltration of its sinusoids and rather frequent small focal accumulations of neutrophils and monocytes, at times obliterating native tissues. The soft granular dark red pulp of the 375 Gm. spleen was severely congested with red blood cells and contained many pigment-laden phagocytes and occasional neutrophils. There was a mild swelling of the epithelial cells of the convoluted tubules of the kidneys, with finely granular débris in the lumen but no inflammatory cell infiltration of these tissues. No ulceration of the intestine was found, but the mesenteric lymph nodes were slightly enlarged and soft. Throughout the entire body, no localizing inflammatory processes could be demonstrated. A guinea-pig, inoculated with postmortem blood, showed no lesions after thirty days, and blood cultures made at the same time remained negative.

COMMENT

In a search through the American literature we could find no references to occurrences of massive pulmonary embolism in patients suffering from Brucellosis, and only casual mention was noted of the occasional occurrence of phlebitis. In the French literature, however, Roger and Audier[2] report cases of phlebitis complicating this disease, and reference is made to cases in which pulmonary embolism occurred.

In the case here reported, marked infection of the alveolar processes and gums was present. This apparently antedated the Brucella infection, and this must be considered a possible focus of infection for the subsequent development of phlebitis, with resultant pulmonary embolism. Roger and Audier bring up the question as to whether phlebitis in these cases is due to primary localization of Brucella melitensis in the veins or whether the phlebitis is due to secondary infection. They are of the opinion that there occurs a venous localization of a melitensis septicemia. In this regard it is interesting to note that an occasional complication of brucellosis has been a vegetative endocarditis, from which Brucella abortus has been isolated.[3]

Foshay[4] has recently observed a case of brucellosis in which edema and cyanosis appeared about the face and head. He believes that a thrombotic process occurred in the deep veins at the base of the brain. His patient recovered.

Of particular interest in the case presented here are the acute and fulminating course of the disease, the drenching night sweats during the last month of illness, the marked oral sepsis, and death due to pulmonary embolism, without clinical evidences of phlebitis until four hours before death.

324 West Superior Street.

2. Roger, H., and Audier, M.: Phlebitis melitococcique, Gaz. d. hôp. **108**: 589 (May 1) 1935.
3. Angle, F. E.: Treatment of Acute and Chronic Brucellosis, J. A. M. A. **105**: 939 (Sept. 21) 1935.
4. Foshay, Lee: Personal communication to the authors.

Special Article

USE OF THE DERMAL PARASITICIDES

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AND
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NEW YORK

This is one of a series of articles written by eminent clinicians for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

In this article we shall confine ourselves to a discussion of the use of parasiticides in the parasitic disorders occurring in dermatologic practice. A discussion of the use of these remedies in diseases of nonparasitic origin would lead us too far afield, since it would embrace almost the entire field of dermatotherapeutics.

In the accompanying list are the most important members of the group of drugs referred to as the parasiticides. They form the basis of present-day antiparasitic therapy. There are other remedies, some of which will be mentioned in the text, but these are purposely omitted in the list. The reasons for their use will be given. A thorough knowledge of the actions of a few valuable remedies and a sufficient acquaintance with their use is more important than the haphazard application of many. Much can be achieved by the proper combination of two or more of these medicaments by variations in their respective percentages and by the choice of the proper vehicle. For these reasons alone, even if for none other, many proprietary remedies may be justifiably condemned.

The parasitic group of diseases forms a not inconsiderable percentage of the total number of cases seen

Most Important Parasiticides

Peruvian Balsam	Sodium Thiosulfate
Chrysarobin	Betanaphthol
Pyrogallol	Sulfur
Iodine	Resorcinol
Mercury Bichloride	Salicylic Acid
Ammoniated Mercury	Benzoic Acid
Tar	Thymol
Phenol	Oil of Cinnamon

in the practice of dermatology. Indeed, some of the members of this group probably affect a major percentage of the population of the United States. It may be said at the very outset that this fact accounts for the numerous remedies employed in the treatment of these skin conditions and also for the vast number of "patent medicines" offered to an innocent public. The credulity of the physician is similarly attacked.

The parasitic diseases affecting man are best grouped into those caused by (*a*) vegetable parasites, the dermatophytes which belong primarily to the group of mucedinae or fungi imperfecti and (*b*) animal parasites including insects, acari and worms. While destruction of the parasite is the objective in the treatment of both, there are material differences between these two groups and each shall be considered separately.

VEGETABLE PARASITES

At least two fundamental considerations are to be considered before the treatment of this group of diseases can be properly undertaken: the first is the manner of the action of the parasiticides, here better called fungicides, and the second is the response of the individual to his infection.

Strictly speaking, the term fungicide is largely a misnomer. Numerous in vitro experiments belie the fungicidal power of most of the remedies listed, some of them even lacking fungistatic powers in high concentrations. Chrysarobin, pyrogallol, sulfur and sodium thiosulfate will not restrain growth of fungi in concentrations of 1:10, salicylic and benzoic acids possess fungistatic properties only in dilutions of 1:50 and 1:40 respectively, but the combination of salicylic and benzoic acids, which forms the basis of the most commonly used antiparasitic ointment, namely, Whitfield's ointment, possesses fungistatic and fungicidal properties in vitro even in high dilutions. Iodine, phenol, betanaphthol and mercury bichloride are fungistatic in high dilutions and fungicidal in considerably stronger concentrations. Resorcinol, a very useful member of this group, is fungistatic in concentrations of 1:200 but is not fungicidal. Thymol and certain volatile oils, such as the oil of cinnamon and the oil of clove, are highly fungicidal even in low concentrations.

Clinically, there can be no question of the efficacy of these remedies. In the superficial dermatomycoses, clinical cure, with negative microscopic and cultural examinations, is easily obtained as a rule even with those drugs which are mildly fungistatic in vitro. An explanation of the action of these remedies must therefore be sought on other than fungicidal grounds.

These clinically active remedies possess two common qualities in varying degrees: (1) they cause exfoliation of the upper layers of the skin and (2) they produce hyperemia when massaged into the skin. In addition, almost all of them are reducing agents. As reducing agents they may cause destruction of fungi, aerobic organisms, by depriving them of the oxygen so necessary to life. Exfoliation is produced either by a desiccant action such as that of resorcinol, in which the upper layers dry up and are cast off, or by keratolytic action such as that of salicylic acid, which causes swelling of the horny layer, which finally splits into scales and is exfoliated. In the superficial dermatomycoses the fungi living in the stratum corneum are thus cast off with the scales, and clinical cure results without actual destruction of the fungi. Histologic examination of normal skin treated with ointments containing these fungicides shows vascular dilatation and evidence of inflammation, even though the latter may not be clinically manifest. This artificially induced inflammatory reaction may play a rôle similar to that of the natural inflammatory reactions, following infection with certain members of the ringworm group, in bringing about the death of the parasite. The latter consideration leads to the second of the two fundamental considerations; namely, the reaction of the host to the parasite.

The group of fungi calls forth responses in the human organism which place them immunologically with the bacterial group, which produces what is designated as the hypersensitivity of infection. In this bacterial group the tubercle bacillus is the best known and most studied example. This group also includes Bacillus mallei, Bacillus typhosus and Brucella abortus.

Trichophytin, an extract prepared from certain fungi, has been as helpful in advancing our knowledge concerning the dermatomycoses as has been tuberculin in the study of tuberculosis, and many analogies exist between the two. The most important of these are that the reaction is specific, is positive in a great percentage of adult people (in the United States) and therefore possesses only limited diagnostic value, is of the delayed type and is negative in most infants even when given in large doses. The reaction can be elicited many years after infection and this state of altered reactivity probably lasts during the lifetime of the individual.

The length of time necessary for the development of the hypersensitive state, that is, the incubation period, varies with the individual and with the type of infection. The superficial dermatomycoses may call forth very little clinical response, and the trichophytin reaction may be negative even if the eruption has persisted for a long time. In the deep, severe, acutely inflammatory, kerion type of infection on the scalp, or in the bearded region, the reaction becomes positive at the end of from ten to fourteen days and the state of hypersensitivity that is developed is sufficient to destroy the fungi and permit the infection to go on to spontaneous healing.

The secondary lesions arising at a distance from the original focus, which on direct microscopic and cultural examination are usually found to be free from fungi, have their analogy in the tuberculids and are variously termed microsporids, epidermophytids and trichophytids, depending on the nature of the organism producing the infection at the source. The "ids" in the very acute infections, such as those of the scalp and beard, go on to spontaneous healing within a relatively short period. In the case of the mycotic infections of the feet, however, the "id," which is almost always located on the hands and fingers, is apt to run a prolonged, recurrent, chronic course, and is also apt to be more recalcitrant to treatment than the original focus.

The foregoing, in a general way, are fundamental considerations which form a necessary background for the proper therapeutic approach to the dermatomycoses. The specific remedies that have been found most useful are best considered by a discussion of the separate disease entities.

RINGWORM INFECTION

The most important member of the group, since it assumes major importance from the standpoint of incidence alone, is the ringworm infection occurring on the hands and feet, the so-called athlete's foot, dermatophytosis of the hands and feet. This disease has definitely been on the increase in recent years, since people have become more sport minded and have been exposed to the infection at golf clubs, beaches, gymnasiums and swimming pools. Dermatophytosis is looked on and classified with the superficial dermatomycoses.

There are primarily three clinical types, which, very briefly, are described as follows:

1. The interdigital variety, with scaling between the toes varying from the mild grade to the severely macerated, white, soggy epidermis, accompanied by fissuring, swelling of the toes, secondary dermatitis and pyogenic infection of the contiguous skin surfaces.

2. The acutely vesicular and vesiculobullous type, which usually appears on the sole of the foot and extends along the arch on to the dorsum of the foot. The vesicles are situated on an erythematous base; they rupture or become desiccated, leaving crusted and finally superficial erythematous areas surrounded by a scaly collarette.

3. The squamous or hyperkeratotic type, which favors the sole of the foot, the arch and the region of the ankle. The lesion is usually well circumscribed, rounded, dry, scaly and erythematous.

The interdigital type of infection usually accompanies the other two varieties. Pruritus is the most important subjective symptom. It may be mild, very severe or at times surprisingly absent. Hyperhidrosis is frequently present. Secondary infection may take place, producing lymphangitis and adenitis of the inguinal glands, which may even go on to suppuration.

Involvement of the nails is manifested by their characteristic dull, lusterless, opaque appearance. Infection may produce deformity of the nail plate, the porcelain-colored streaks of leukonychia trichophytica or separation of the nail plate by an underlying hyperkeratosis.

There appears to be a widespread general impression that ringworm of the feet is so recalcitrant to treatment as to be considered incurable.

PRESCRIPTION 1.—*For Ringworm*

	Gm. or Cc.
℞ Iodine	1.2
Salicylic Acid	
Benzoic Acid āā	3.6
Alcohol 90 per cent, q. s. ad	120.0

PRESCRIPTION 2.—*For Ringworm*

	Gm. or Cc.
℞ Salicylic Acid	6.0
Resorcinol	3.6
Alcohol 90 per cent, q. s. ad	120.0

PRESCRIPTION 3.—*For Ringworm*

	Gm. or Cc.
℞ Thymol	
Oil of Cinnamon āā	2.0
Alcohol 90 per cent, q. s. ad	120.0

PRESCRIPTION 4.—*For Ringworm*

	Gm. or Cc.
℞ Thymol	0.3
Salicylic Acid	1.0
Alcohol 80 per cent	30.0

PRESCRIPTION 5.—*Whitfield's Ointment (Original Formula)*

℞ Benzoic Acid	grs. xxv
Salicylic Acid	grs. xv
Paraffin mol.	ʒ II
Ol. cocois nucis ad	ʒ I

PRESCRIPTION 6.—*Whitfield's Ointment (N. F.)*

	Gm. or Cc.
℞ Benzoic Acid	12.0
Salicylic Acid	6.0
Wool Fat	5.0
White Petrolatum, q. s. ad	100.0

PRESCRIPTION 7.—*Ammoniated Mercury Ointment, U. S. P.*

	Gm. or Cc.
℞ Ammoniated Mercury	10.0
Wool Fat	5.0
White Wax	5.0
White Petrolatum	80.0

PRESCRIPTION 8.—*Sulfur Ointment, U. S. P.*

	Gm. or Cc.
℞ Precipitated Sulfur	15.0
Wool Fat	5.0
Yellow Wax	5.0
White Petrolatum, q. s. ad	100.0

PRESCRIPTION 9.—*Chrysarobin Ointment, U. S. P.*

	Gm. or Cc.
℞ Chrysarobin	6.0
Wool Fat	5.0
Yellow Wax	5.0
Chloroform	4.0
Liquid Petrolatum	6.0
Petrolatum, q. s. ad	100.0

PRESCRIPTION 10.—*Dusting Powder*

	Gm. or Cc.
℞ Thymol	1.2
Boric Acid	20.0
Zinc Oxide	
Talc	
Zinc Stearate āā ad	60.0

Sig.: Apply between toes each morning and after bath.

PRESCRIPTION 11.—*Dusting Powder*

	Gm. or Cc.
℞ Sodium Thiosulfate	
Thymol Iodide	
Boric Acid āā	10.0
Lycopodium	
Talcum āā ad	60.0

Sig.: Apply between toes each morning and after bath.

The choice of the proper remedy diligently applied and continued in decreased concentrations long after the last vestiges of the disease have disappeared will serve to cure almost all cases. Diligence and persistence are the prerequisites of successful treatment. In the recurrent case, treatment must be instituted with the appearance of the first signs of recurrence, usually with the approach of warm weather.

For the macerated, soggy, interdigital infection and for the dyshidrotic variety, alcoholic lotions are most suitable; for the hyperkeratotic variety, ointments are most effective.

In prescriptions 1 to 11 are given time-tried, time-honored and most useful remedies. These stand high in the list of eczematogenous substances and the possibility of sensitization to one or another of the ingredients, with an ensuing dermatitis, must always be kept in mind. The patient should be warned against continuing with the use of the remedy in case of irritation. It is most advisable to start with one-half the strength of the active ingredients as listed and gradually increase to full strength.

The 10 per cent solution of silver nitrate, so popular a decade or two ago, seems to have lost face and unfortunately so, since in the interdigital, macerated, fissured type infection it remains one of the most effective remedies.

The useful adjuvant to the various active medicaments listed, in every form of infection, is the hot potassium permanganate solution foot bath, about 10 grains (0.65 Gm.) to the basin of hot water, the feet being soaked for one-half hour daily. In the very acute and very severe processes that incapacitate the individual and make walking impossible, soaks with potassium permanganate 1:2,000 or with Burow's Solution diluted 1:15 for three or four hours daily or continuous wet dressings, with these solutions, give the greatest relief and the most rapid objective improvement.

Unless fungi can be cultivated from the lesions on the hands they are to be considered as dermatophytids and should be treated with soothing, keratoplastic and mildly stimulating remedies. The choice of the remedial agent will depend on the clinical appearance, but antiparasitic treatment is not indicated.

For prophylaxis of ringworm of the feet, solutions of from 0.5 to 1 per cent of sodium hypochlorite are used in all adequately equipped gymnasiums, clubs and schools. Statistical studies show that the incidence of ringworm infection in these places has been materially reduced. Its use is recommended. It need hardly be added that walking barefooted is at all times to be avoided.

An approach to the treatment of ringworm of the scalp requires cultural studies and the mycologic classification of the parasite in every case. Ringworm of the scalp is caused by the microsporon and trichophyton groups of fungi, including both the human-pathogenic and animal-pathogenic varieties. The prognosis as to cure, by the use of topical remedies alone, depends largely on whether or not the fungus is of the animal variety, since the lesions in patients infected with an animal type of ringworm tend to go on to spontaneous healing. The animal type of infection is therefore amenable to treatment with the fungicides listed later.

Infections with the human variety of parasite are more resistant to topical agents even if used over a period of many months. In order to effect a rapid cure and to prevent the inconveniences associated with the isolation of children, recourse must therefore be had, in most instanees, to epilation with x-rays. In children approaching puberty, the treatment should be conservative and consist only of the application of the milder antiparasiticides, since spontaneous cure takes place at that time. (The dangers of internally administered depilating drugs, such as thallium acetate, are too great to permit their general employment.)

Repeated mycologic examinations of hair and scales and, whenever possible, examination under a Wood's filter light are necessary during the course of treatment. The patient must not be discharged from observation until repeated examinations have proved negative.

The clinical appearance of ringworm of the scalp is varied but can be roughly divided into several groups. The most common in the United States is the dusty appearing, gray, finely scaly variety with oval or rounded patches, in which the hairs are broken off, from 2 to 3 mm. in length, lusterless and lifeless in appearance. This variety is usually caused by Microsporon Audouini. The disseminated form, with more numerous, smaller and more irregular patches, has large scales, heaped up and adherent, in which the hairs are broken off or matted between the scales. There is also a pustular variety most often produced by the ectothrix type of trichophyton. The inflammatory and suppurative processes may be mild or may be so severe as to produce large, boggy swellings with draining sinuses. This variety, known as kerion celsi, heals spontaneously and requires only mild antiseptic wet dressings and soothing remedies.

The practical therapeutic procedures consist first in isolation of the child from other children so as to prevent the transmission of the disease. Adults can be considered to be immune, although occasional adult infection does occur. The hair is to be cut short and kept short, washed with tincture of green soap daily or every other day, and the infected hairs are to be removed with epilation forceps, a few dozen at a time. A washable cap is to be worn at all times until the condition is cured. The following remedies and methods of treatment are suggested.

1. Ten per cent Iodine crystals in anhydrous wool fat. This is very effective and should be applied with a soft tooth brush morning and night. As soon as the reaction becomes severe, treatment is to be suspended for several days and then resumed.
2. Two per cent Tincture of Iodine, dabbed on liberally morning and night.
3. The preparation given in prescription 12.

PRESCRIPTION 12.—*For Ringworm of the Scalp*

	Gm. or Cc.
℞ Precipitated Sulfur	6.0
Salicylic Acid	3.0
Castor Oil	6.0
Petrolatum, q. s. ad	60.0

Sig.: Massage in thoroughly morning and night.

PRESCRIPTION 13.—*For Ringworm of the Scalp*

	Gm. or Cc.
℞ Pyrogallol	5.0
Salicylic Acid	5.0
Castor Oil	10.0
Petrolatum, q. s. ad	50.0

4. The preparation given in prescription 13.
5. Chrysarobin may be substituted for pyrogallol in prescription 13, but precautions must be taken to avoid the annoying conjunctivitis produced by chrysarobin when coming into contact with the eyes. The areas may be covered with zinc oxide adhesive plaster or with collodion.
6. The preparation given in prescription 14.

PRESCRIPTION 14.—*For Ringworm of the Scalp*

℞ Ammoniated Mercury	5-10 per cent
Salicylic Acid	3- 5 per cent
Benzoinated Lard, q. s.	

Irritants such as croton oil, oil of clove and oil of turpentine are used in the superficial variety in an attempt to induce suppuration, thereby converting the superficial into the kerion type. The use of these remedies is not recommended, since they will often produce pronounced scarring. This is not justifiable in a condition that can be treated by other, more satisfactory means.

The principles governing the treatment of tinea barbae are essentially the same as those of tinea of the scalp. Tinea of the bearded region in this country is usually of animal origin and the eruption is of the acute suppurative nodular variety, with boggy swellings and draining sinuses. The infection often goes on to spontaneous cure in a period of about six to twelve weeks. These cases require nothing more than mild antiseptic remedies such as wet dressings of 1:5,000 mercury bichloride and removal of the loose, diseased hairs, followed by the application of an ointment containing 5 per cent ammoniated mercury (U. S. P. ointment mixed with equal parts of petrolatum). The less inflammatory, nonsuppurating type requires more strenuous treatment with the stronger ointments listed, x-ray epilation, or continuous epilation with forceps.

Tinea favosa, or favus, caused by the achorion group of fungi, is a disease that is quite common in central Europe and is only rarely encountered in this country. It may occur at any age and may attack the scalp, the nails or the glabrous skin. On the skin the eruption is characterized by the pathognomonic sulfur yellow cups, scutula, which may be isolated and few or in juxtaposition, forming sheets covering large areas. It is easily cured by removal of the cups and by daily paintings with tincture of iodine diluted two or three times with alcohol, or with the milder antiparasitic ointments.

Besides the form in which one finds the typical yellow cups traversed by hair, lusterless and lifeless in its lower portions, favus is also present on the scalp in a pityriasiform and an impetiginous form. In the former, erythematous patches varying in size and number are distributed throughout the scalp covered with adherent, grayish scales. In the latter, one finds yellowish crusts. Microscopic examination of hair and crusts will establish the diagnosis.

On the scalp the lesions are extremely resistant to treatment and require continued and diligent application of remedies over a long period. The treatment is essentially the same as that of ringworm of the scalp; namely, the use of antiparasitic remedies and epilation. Good results are achieved with persistent treatment, and progress of the disease may be arrested. Some cases remain obdurate for a lifetime; others go on to spontaneous healing when destruction of the follicles leads to atrophy and permanent alopecia.

Tinea circinata is a superficial form common on the glabrous skin of adults and children, which may be caused by various fungi of both human and animal varieties. The lesions are circinate, distinctly outlined spots with clearing centers and with an unbroken erythematosquamous border, which advances peripherally, is frequently vesicular and gives rise to lesions that may reach the size of a palm. A single lesion or

PRESCRIPTION 15.—*For Tinea Circinata*

	Gm. or Cc.
℞ Precipitated Sulfur	3.0
Salicylic Acid	1.8
Petrolatum, q. s.	60.0

lesions in large numbers may be present. The exposed surfaces of the body are most often involved. In children the scalp must be carefully examined and observed for a time after the body lesions have been cured. Treatment consists in painting the lesions daily with a 2 per cent tincture of iodine or daily application of the ointment given in prescription 15. An effort should be made to determine the source, in order to prevent further infection.

Tinea cruris, the old eczema marginatum of Hebra, is an erythematous, superficial, scaly eruption in the crural region, which extends downward on the inner aspects of the thighs, sometimes extending upward to the pubic region and posteriorly to the buttocks. The eruption is well defined, sharply marginated, with a definitely raised border, which is at times vesicular. Tinea cruris responds readily to mild antiparasitic remedies and recurrence takes place only if treatment is discontinued too soon. The most pleasant method of treatment consists in the application of a shake lotion (prescription 16) painted on with a brush,

PRESCRIPTION 16.—*Shake Lotion for Tinea Cruris*

		Gm. or Cc.
℞	Resorcinol	4.8
	Calamine	15.0
	Zinc Oxide	25.0
	Glycerin	12.0
	Lime Water	15.0
	Rose Water, q. s. ad	120.0

morning and night. Cases resistant to this treatment and requiring the addition of 5 per cent precipitated sulfur are rare.

Tinea versicolor, caused by Microsporon furfur, with its smooth or slightly scaly, fawn colored patches of varying size and shape, is found on the chest and back but may also spread to other areas. The eruption causes no symptoms, it is harmless and the individual presents himself for treatment primarily for cosmetic reasons. The eruption is found more often in those who have a tendency to perspire freely and therefore occurs frequently in the tuberculous. Daily baths, using soap freely, followed by vigorous application of a 10 per cent aqueous solution of sodium thiosulfate, will cause the disappearance of the eruption within a week. Infection in the pubic region is often overlooked. It is wise to treat this area in a routine manner in all patients. Treatment must be persisted in for at least several weeks to avoid recurrence. The underclothes must be boiled.

Erythrasma, caused by Microsporon minutissimum, affects the same areas as tinea cruris and is sometimes confused with it. Not infrequently erythrasma also affects the axillae. In contradistinction, erythrasma is more brownish red, is not elevated and has no raised vesicular border. The treatment is the same as that of tinea cruris.

MONILIA

The mycoses caused by yeastlike organisms have a striking resemblance to those caused by the ringworm group. They produce similar clinical pictures and affect the same areas. Mycologic studies are often necessary in order to determine whether one is dealing with ringworm or with yeast infections. Yet these organisms are not immunologically related. Patients with pure monilia infections react strongly to oidiomycin, an extract produced from the monilia group of organisms, while their reaction to trichophytin is negative or, if positive, is based on previous infection with ringworm organisms. Positive passive transfer tests may be elicited by various members of the ringworm group with serum from an individual urticarially hypersensitive to trichophytin, whereas the members of the yeastlike group will give negative results with this serum.

The great folds and clefts of the body are the sites of predilection for infection with monilia and so one finds that the interdigital spaces, the crural and anal regions, the vulva, the areas beneath the breasts in women and the abdominal folds in the obese, are the sites most often involved. The characteristic picture in one of these large folds shows a grayish white, sodden macerated band of variable width, usually narrow, running along the cleft, with an erythematous, moist, shiny area extending beyond the grayish border. Outlying satellite, pinhead sized, papular, vesicular and pustular lesions are almost always present.

These infections occur more frequently in diabetic patients and in the obese. It is wise to study all these patients from this point of view and, whenever deemed advisable, to reduce the carbohydrate intake. Wet dressings with a 0.25 per cent silver nitrate solution for from twenty-four to forty-eight hours followed by the use of the 4 per cent resorcinol lotion (prescription 16) will often be sufficient to effect a cure. An attempt must be made to keep the parts dry by the liberal use of dusting powder in these areas, and an attempt must also be made to prevent the skin surfaces from coming directly into contact with each other. Interdigital infection with monilia is very common. The clinical appearance and the treatment is the same as that of interdigital ringworm.

Erosio interdigitalis blastomycetica occurs chiefly in those keeping their hands immersed in water a great deal and therefore in housewives and persons employed in occupations such as canning and "soda jerking." The eruption is almost always located in the web between the middle and ring fingers, extending on the sides of the fingers for a variable distance, is shiny, moist, erythematous and at times covered with a central, grayish, sodden epidermis. Prophylaxis is the first principle of treatment. The hands must be protected against the effects of moisture by the use of rubber gloves or by abstaining from those processes requiring immersion of the hands. The eruption can readily be cured by painting a 5 per cent solution of silver nitrate on the affected parts morning and night, or by the daily application of a 2 per cent tincture of iodine solution. Sulfur Ointment, U. S. P., or Ammoniated Mercury Ointment, U. S. P., are equally efficacious. These ointments should first be used in half strength, i. e., by mixing with equal parts of petrolatum or some other ointment base, and then, if necessary, used full strength.

Not infrequently changes in the nails and paronychia accompany the interdigital infection. The nails become lusterless, opaque and thickened, with transverse or longitudinal ridges. The eponychium becomes erythematous and edematous. These patients cannot be cured unless they abstain from the use of water on the skin. Locally, superficial, unfiltered fractional doses of x-rays

PRESCRIPTION 17.—*Ointment for Perlèche*

		Gm. or Cc.
℞	Ammoniated Mercury	3.0
	Salicylic Acid	1.8
	Wool Fat	5.0
	Petrolatum, q. s. ad	60.0

combined with the use of half strength Sulfur Ointment, U. S. P., or half strength Ammoniated Mercury Ointment, U. S. P., gives the best results.

Erosio interdigitalis blastomyectica, paronychia and perlèche are so frequently associated as to be considered a triad. It must not be accepted that all cases of perlèche are due to monilia infection, since cultural examination may show only streptococci and staphylococci. Perlèche manifests itself by fissures at the corners of the mouth, at times covered with a whitish pellicle on an erythematous base. In severe cases of long standing, the mucous membrane of the cheek becomes involved. Pain may or may not be present, depending on the depth and extent of the fissuring. Treatment consists in the daily application of a 2 per cent aqueous

solution of silver nitrate, a 1 per cent aqueous solution of copper sulfate or of the ointment given in prescription 17.

The use of wet dressings or the continuous water bath may give rise to a very superficial vesicular and

PRESCRIPTION 18.—*Dusting Powder*

		Gm. or Cc.
℞	Sodium Borate	
	Boric Acid	āā 8.0
	Zinc Oxide	
	Talc	āā ad 60.0

PRESCRIPTION 19.—*Resorcinol Lotion*

		Gm. or Cc.
℞	Resorcinol	2.5
	Zinc Oxide	
	Talc	āā 30.0
	Glycerin	12.0
	Lime Water	15.0
	Rose Water, q. s.	ad 120.0

pustular eruption, often covering large body areas. This is referred to as bath mycosis. Treatment necessitates the discontinuance of the water bath or the wet dressing and the application of dusting powder, such as the one given in prescription 18, or painting liberally three times daily until cured with the lotion given in prescription 19.

ANIMAL PARASITES

The treatment of animal parasitic diseases offers a problem much less difficult. Here one is dealing with animal life on the skin surface or in the horny layer of the epidermis or on the underwear. In rare instances the parasite is to be found below the epidermis. The parasite either is accessible or can be made more accessible by solvents of the horny layer and it is readily destroyed by even small concentrations of the parasiticides. The primary consideration should therefore be to do no harm, since the remedies employed are, in high concentrations, irritants, and also since the number of people who have a heightened susceptibility to these remedies is not inconsiderable.

As a group, the animal parasites account for from 8 to 10 per cent of patients encountered in clinic practice. The percentage in private practice is much smaller, since this group of diseases occurs more commonly in the poorer classes, in people who are more subjected to crowding and people whose personal hygiene is both poor and apt to be neglected. There are only two diseases in this group which are of significance because of their frequency; namely, pediculosis and scabies.

PEDICULOSIS

Three kinds of lice are parasitic to man: the head louse, the body louse and the pubic louse.

Head lice, causing pediculosis capitis, are found in childhood but at times also affect the adult. The lice cause severe itching and scratching, which may give rise to secondary excoriations, impetiginized lesions, folliculitis and even abscess of the scalp. Secondary infection may be accompanied by swelling of the glands of the neck. A large number of ova, attached by a chitinous membrane to the hair, are distributed throughout the scalp. The diagnosis is simple indeed.

The ease with which the parasite can be destroyed is borne out by the method of treatment used at the Saint Louis Hospital in Paris in the severe cases in which the head teems with pediculi, namely, the application of a thick layer of petrolatum over the entire scalp, which is then bandaged overnight. The parasites are destroyed by suffocation. Pediculi may be destroyed by the application of an aqueous solution of mercury bichloride 1:5,000, a 2 per cent betanaphthol ointment, a 5 per cent sulfur ointment, or a 10 per cent salicylic acid ointment. The last mentioned possesses the added advantage of loosening the ova (nits) and softening the crusts so often found in lousiness of the scalp. The nits are best removed with a fine comb dipped in hot vinegar, which dissolves the chitinous membrane attaching the nit to the hair. The danger accompanying the use of the easily ignitable crude petroleum cap, which enjoys a certain modicum of popularity, should be sufficient to cast this form of treatment into the limbo of discarded procedures.

Body lice, causing pediculosis corporis, inhabit the clothing coming into contact with the skin and are characteristically found in the seams of the underclothing. Sterilization of the clothes and personal cleanliness will suffice to effect a cure.

Pubic lice, causing pediculosis pubis, are not confined to the pubic region but will be found also on the thighs and in the perianal region, buttocks, axillae, eyebrows, eyelids and beard. They will not live in the scalp. Mercurial ointment, almost a classic form of treatment, is mentioned only to be condemned. The use of an ointment of such strength for the destruction of pediculi is unwarranted. The dermatitis and also the stomatitis to which it may give rise, even after a single application, is more serious and more annoying than is the pediculosis. Such strenuous measures are unnecessary. An ointment such as the one given in prescription 20, or the U. S. P. Ammoniated Mercury

PRESCRIPTION 20.—*Ointment for Pediculosis Pubis*

		Gm. or Cc.
℞	Precipitated Sulfur	3.0
	Betanaphthol	1.8
	Wool Fat	5.0
	Petrolatum, q. s.	ad 60.0

Ointment in one-half strength, is efficacious without the disadvantages obtaining from the use of the strong or mild mercurial ointment. Also to be recommended

PRESCRIPTION 21.—*Peruvian Balsam*

		Gm. or Cc.
℞	Peruvian Balsam	
	Alcohol (60 per cent)	āā 30.0

Sig.: To be rubbed gently into affected parts morning and night.

PRESCRIPTION 22.—*Mercury Bichloride Solution*

		Gm. or Cc.
℞	Mercury Bichloride	0.5
	Glycerin, q. s.	ad 100.0

are prescriptions 21 and 22. The mercury bichloride solution is applied for three or four nights in succession and then less frequently, every three to seven days, for from two to three weeks.

The ova are removed with xylene or with hot vinegar, as mentioned under pediculosis capitis. A cure in this condition is not to be expected in less than a week; in those with a profuse growth of hair on the abdomen and chest, cure may be delayed two weeks or even longer. Daily and diligent application of remedies is essential. Shaving of the affected parts will hasten the cure, but the discomfort attendant on shaving the affected areas may be obviated by the conscientious application of the remedies.

Scabies is a contagious dermatosis caused by an acarus, Sarcoptes scabiei, in which the female of the species burrows into the skin, within the horny layer, usually at some favored site, depositing ova and excrement along this tunnel. The ova hatch in from four to six days and are ready to repeat the cycle. The male of the Acarus family lives on the skin surface and is easily disposed of.

The eruption is symmetrical and has a characteristic distribution affecting primarily the webs of the fingers, the flexor surfaces of the wrists, the elbows, the anterior axillary fold, the ankles and the buttocks; in women, the breasts and nipples; in men, the penis, and in children the palms and soles. Needless to say, the lesions may appear in other areas but the eruption is characteristically absent above the clavicular level. In the unhygienic the eruption is apt to be characteristic, severe, with numerous vesicles, with secondary scabietic eczema due to scratching and with secondary infected lesions. In the cleanly it may be so mild as to offer difficulty in diagnosis. However, the contagious character of the eruption, the nocturnal pruritus, and finally the demonstration of the acarus help in establishing the diagnosis even in these questionable cases.

Destruction of the parasites and ova will cure the itch. Sulfur is the time-honored remedy and the remedy of choice. The parasiticidal action of sulfur is, in all probability, due to the formation of hydrogen sulfide on the skin, which, even in low concentration, is fatal to animal life. The patient is instructed to take a warm bath and to wash thoroughly with soap and water for at least one-half hour. Sulfur ointment, U. S. P., one-half strength, is then massaged gently over the body below the clavicular level. Application of the salve, without bathing, is repeated on the two succeeding nights, and on the fourth night the patient is instructed to bathe again. During this course of treatment the same bed linen and underclothing are used. At the end of the course the linen and clothing are both changed. Sterilization of the underclothing and bed linen is essential. Recurrence is to be attributed to reinfection, in which both improper care of the clothing and the original source of contact play no small part. For obvious reasons, all members of a family who are infected are to be treated at the same time. The patient is to be observed again after a period of several days, and if he is not symptom free and if the physician is convinced that the pruritus is not due to irritation from sulfur, and also that the scratching is not due to habit alone, he is to undergo another course of treatment. Two courses of treatment properly carried out should be sufficient to cure scabies.

In the more severe type of case seen in clinic practice, stronger ointments are used. The addition of soaps and alkalis, such as potassium carbonate, makes for better penetrating power into the burrow. The best known of these are prescriptions 23 and 24.

PRESCRIPTION 23.—*Compound Ointment of Sulfur, N. F.*

		Gm. or Cc.
℞	Precipitated Calcium Carbonate	10.0
	Sublimed Sulfur	15.0
	Juniper Tar	15.0
	Soft Soap	30.0
	Solid Petroxaline	30.0

PRESCRIPTION 24.—*Alkaline Ointment of Sulfur, N. F.*

		Gm. or Cc.
℞	Flowers of Sulfur	20.0
	Potassium Carbonate	10.0
	Ointment base to make	100.0

Another convenient and effective method used in the treatment of scabies in children is the one advocated by Sherwell. Before retiring, the child's body is gently rubbed with flowers of sulfur and then the child is permitted to sleep in a bed that has been sprinkled with the flowers of sulfur. The duration of treatment is one week. Dermatitis from this form of treatment is rare.

There are many other remedies used in the treatment of scabies, but these will be mentioned only briefly. Peruvian Balsam from 5 to 15 per cent in ointment form or mixed with equal parts of alcohol is useful. Styrax, another balsamic, may also be used in ointment form or as in prescription 25.

PRESCRIPTION 25.—*Styrax Ointment*

		Gm. or Cc.
℞	Styrax	50.0
	Alcohol	
	Linseed Oil āā	25.0

Betanaphthol may be substituted for sulfur in any of the foregoing ointments in 2 to 5 per cent concentration, but it is apt to produce the same toxic effects that are caused by phenol when used over large areas.

200 West Fifty-Ninth Street.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT.

PAUL NICHOLAS LEECH, Secretary.

REPORT ON THE PRESENT STATUS OF TETRACHLORETHYLENE

Tetrachlorethylene is an unsaturated halogenated aliphatic hydrocarbon with specific gravity of 1.60, a boiling point of 121 C. and a chlorine content of 85.5 per cent. It has become an official drug by its admission to the new National Formulary. It is stated to contain not less than 99 per cent and not more than 99.5 per cent of $CCl_2:CCl_2$—the remainder consisting of alcohol. It is claimed to be a useful agent in the treatment of hookworm infestation as evidenced by the many clinical as well as experimental reports which have appeared in medical literature.

Garrison,[1] writing on the use of tetrachlorethylene in the treatment of hookworm in children, noted the following percentage of infestations: 26 per cent (estimated)[2] of Southern school children; 15 per cent of a certain series of 5,000 hospital admissions; 22 per cent of the 121,388 specimens examined by nine state departments of health in 1930; 50 per cent of the individuals in a Mississippi CCC camp, and 51 per cent of certain groups of Mississippi school children.

Lamson, Brown and Ward[3] reviewed 500 references to the treatment of hookworm and Ascaris, on which a total of 300 different anthelmintics were employed. They studied an additional 300 agents against Ascaris and pointed out that all agents in common use (except tetrachlorethylene and hexylresorcinol) were well known poisons.

The high efficiency of chloroform in the treatment of infestations led Hall to use carbon tetrachloride in animals and it was later used extensively in man. Hall and Shillinger[4] studied other related compounds including ethylene dichloride and tetrachlorethylene. They employed the latter agent in twenty-three infested dogs and found it to be an efficient anthelmintic. Christiansen and Lynch[5] concluded from their comparative studies of tetrachlorethylene and hexylresorcinol in animals that although there was only mild fatty infiltration of the liver and no kidney involvement, there was (post mortem) spongy shriveled and inflamed intestines. They claimed that the heart and respiration were both depressed but they used 1, 2 and 3 cc. of the drug in these dogs. Lamson and his co-workers did not class tetrachlorethylene with carbon tetrachloride because the guanidine content of the blood did not change as with the latter.[3] This is especially advantageous in treating infested patients have calcium deficiency. Schlingman and Gruhzit[6]

1. Garrison, H. F.: Comparative Value of Tetrachlorethylene in Children, South. M. J. **27**: 24 (Jan.) 1934.
2. Stiles, C. W.: Address before the Southern Medical Association, Nov. 14, 1933.
3. Lamson, P. D.; Brown, H. W., and Ward, Charlotte B.: Anthelmintics, J. A. M. A. **99**: 292 (July 23) 1932.
4. Hall, M. C., and Shillinger, J. E.: A New Anthelmintic, Am. J. Trop. Hyg. **5**: 229 (May) 1925.
5. Christiansen, B. V., and Lynch, H. J.: Effect of Anthelmintics on the Host: I. Tetrachlorethylene; II. Hexylresorcinol, J. Pharmacol. & Exper. Therap. **48**: 311 (July) 1933.
6. Schlingman and Gruhzit: Toxicity of Tetrachlorethylene. J. A. V. M. A. **71**: 189 (May) 1927.

found very slight changes, principally in the liver. Maplestone and Chopra [7] found it much less toxic than carbon tetrachloride and concluded from their experiments that it caused no damage to the organs of otherwise healthy animals (cats) in therapeutic doses. Lamson and his co-workers [8] pointed out that little if any [?] was absorbed from the dog's intestinal tract in the absence of fat. If fat was present, however, it produced hypnotic symptoms; even death.

Noting these experiments, Hall and Shillinger [4] and Lamson and his co-workers [8] were of the opinion that since it is less toxic than carbon tetrachloride, and as efficient as the latter, its clinical use would not be contraindicated.

Garrison [1] compared tetrachlorethylene with oil of chenopodium and carbon tetrachloride in 627 children and his results were much more satisfactory than with the latter two agents. Schapiro and Stoll [9] found that 3 cc. reduced the egg count 81 per cent and 2 cc. reduced it 77 per cent, as compared with 47 per cent reduction using 1.5 cc. of oil of chenopodium and 24 per cent with less than 1 cc. of the oil. Smith [10] used 1 cc. in 276 school children and claimed an effectiveness of 90.5 per cent.[6] Garin, Rousset and Gonthier [11] used 3, 4 and 5 Gm. (1 Gm. at hourly intervals) doses on successive days in 371 treatments, treatments resulting in 332 expulsions, most of which occurred after one treatment. Maplestone and Mukerji [12] reported it not superior to carbon tetrachloride except that it might be less toxic. Later they [13] found it satisfactory, in combination with oil of chenopodium and magnesium sulfate. In a series of fifty cases, using Lane's centrifuge method (considering ordinary counts unreliable), they reported thirty-one negative ten days after the first treatment and twelve more after a second treatment. Garrison [1] noted that negative stools were obtained in 49 per cent of the cases in the CCC camp mentioned after 2 cc. of tetrachlorethylene had been given. Kendrick [14] concluded from his work that it was superior against Ancylostoma in doses of 3 cc. (in fifty-nine cases) and 2 cc. (in fifty cases). He further noted it inferior to 2.4 cc. of a 3 to 1 mixture with oil of chenopodium in thirty cases of Necator infestation. Soper [15] had previously reported fifteen cases with similar but less favorable results against Ancylostoma and far less favorable against Necator in comparable work in which carbon tetrachloride was used for control. The same decreasing order of resistance against all these agents is reported by both authors: [16] female Ancylostoma, male Ancylostoma, male Necator, female Necator.

Lamson [8] noted that the use of the older remedies involved a possible risk of death, a fair chance of collapse, an acute nephritis from betanaphthol, disturbance of vision with santonin, deafness from oil of chenopodium, and necrosis of the liver with carbon tetrachloride. He and his co-workers [8] felt that severe intoxications were much more frequent than reported. They were of the opinion that tetrachlorethylene differed from chloroform and carbon tetrachloride in causing no pathologic or functional change. They stated that they had been assured the product would not break down to phosgene. (This factor caused some earlier workers to abandon its use.)

Lambert [17] reports 286,486 cases of hookworm disease treated with tetrachlorethylene or carbon tetrachloride either alone or in combination with oil of chenopodium. Early in the series there were seven deaths: one from oil of chenopodium without purge and six after carbon tetrachloride. Over a period of four years he used tetrachlorethylene in 46,000 cases with no deaths and with fewer toxic symptoms than with other agents. Lamson [8] felt that the lowered toxicity permitted the use of a less violent cathartic and suggested sodium sulfate in place of the magnesium sulfate. It has been reported [18] that tetrachlorethylene could be given with alcohol and that its toxicity was not affected by alcohol but it would seem preferable to avoid the combination.

The toxic effects (reactions) consist of giddiness, vomiting and drowsiness,[18] although these are supposedly not related to liver effects.[18] The experimental occurrence of cardiac and respiratory depression has not been encountered clinically: no change in rate of either, although there was a slight lowering of blood pressure. Sharp [19] felt that reactions were more frequent in children, while Garrison [1] had little difficulty with his young patients (they were confined to bed during the procedure).

Tetrachlorethylene has been used against other worms with little or no success except in the case of Trichuris infections.[20]

Lambert [17] (after treating 46,000 cases with tetrachlorethylene and over 200,000 cases with other agents) considers it the most satisfactory anthelmintic against hookworm disease. Lamson [3] reported that it was just as good as any drug or combination of drugs against both Necator and Ancylostoma. Maplestone and Mukerji [13] considered it superior to carbon tetrachloride and safer than either the latter or oil of chenopodium. Garrison,[1] after using it in children, considered it to be satisfactory, most economical, and the best anthelmintic against hookworm.

The Council authorized publication of the foregoing report on the present status of tetrachlorethylene.

In the 1937 edition of New and Nonofficial Remedies there will appear a description of tetrachlorethylene with a considered statement of actions and uses.

7. Maplestone, P. A., and Chopra, R. N.: Toxicity of Tetrachlorethylene to Cats, Indian M. Gaz. **68:** 554 (Oct.) 1933.
8. Lamson, P. D.; Robbins, B. H., and Ward Charlotte B.: Pharmacology and Toxicology of Tetrachlorethylene, Am. J. Hyg. **9:** 430 (March) 1929. Symposium: Tetrachlorethylene in Hookworm Infestations, Internat. M. Digest **16:** 247 (April) 1930.
9. Schapiro, L., and Stoll, N. R.: Preliminary Note on Anthelmintic Value of Tetrachlorethylene, Am. J. Trop. Med. **7:** 193 (May) 1927.
10. Smith, M. E.: Tetrachlorethylene in the Treatment of Hookworm, J. M. A. State of Alabama **2:** 75 (Aug.) 1932.
11. Garin, C.; Rousset, J., and Gonthier, B.: Tetrachlorethylene, a New Anthelmintic, Bull. et mém. Soc. méd. d. hôp. de Paris **55:** 1003 (June 15) 1931.
12. Maplestone, P. A., and Mukerji, A. K.: Tetrachlorethylene in the Treatment of Hook Worm Disease, Indian M. Gaz. **64:** 424 (Aug.) 1929.
13. Maplestone, P. A., and Mukerji, A. K.: Tetrachlorethylene Therapy of Hook Worm Disease, Indian M. Gaz. **68:** 617 (Nov.) 1933.
14. Kendrick, J. F.: Tetrachlorethylene, Am. J. Trop. Med. **9:** 483 (Nov.) 1929.
15. Soper, F. L.: Tetrachlorethylene in the Treatment of Hookworm Disease, Am. J. Trop. Med. **6:** 451 (Nov.) 1926.
16. Kendrick.[14] Soper.[15]
17. Lambert, S. M.: Hookworm Disease in the South Pacific, J. A. M. A. **100:** 247 (Jan. 28) 1933.
18. Lamson, Brown and Ward.[8] Maplestone and Mukerji.[13]
19. Sharp, E. A.: Relation of Toxicity to Dosage of Tetrachlorethylene, J. Trop. Med. **33:** 336 (Nov. 15) 1930.
20. Hall and Shillinger.[4] Maplestone and Chopra.[7] Garin, Rousset and Gonthier.[11]

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

POLLEN ANTIGENS-LEDERLE (See New and Nonofficial Remedies, 1936, p. 35).

The following additional products have been accepted:

Ash Pollen Antigen-Lederle; Beech Pollen Antigen-Lederle; Birch Pollen Antigen-Lederle; Hickory Pollen Antigen-Lederle; Poplar Pollen Antigen-Lederle; Sycamore Pollen Antigen-Lederle.

ANTIPNEUMOCOCCIC SERUM TYPES I AND II COMBINED (See New and Nonofficial Remedies, 1936, p. 374).

Mulford Biological Laboratories, Sharp & Dohme, Philadelphia and Baltimore.

Antipneumococcic Serum, Types I and II Combined-Mulford.—A serum obtained from horses immunized with type I and type II pneumococci and standardized by animal potency tests. It is marketed in packages of one 50 cc. double end vial and in packages of one vial for intravenous injection.

Dosage.—From 50 to 100 cc. given intravenously and repeated every six to eight hours until the temperature falls and beneficial effects are evident.

Antipneumococcic Serum, Concentrated (Pneumococcus Antibody Globulin, Types I and II)-Mulford.—A serum obtained by immunizing horses with intravenous injections of type I and type II pneumococci. It is subjected to the usual sterility and safety tests by injection into white mice and guinea-pigs. Standardization is effected on the basis both of the mouse protection test and by a specific polysaccharide precipitation test devised by Zozaya, Boyer and Clark (*J. Exper. Med.*, October 1930, p. 471). The potency of the product is expressed in terms of the unit described by Felton (*J. Infect. Dis.*, September 1925, p. 199; October 1925, p. 309; THE JOURNAL, June 14, 1930, p. 1893). Marketed in packages of one 10 cc. syringe containing 10,000 units and in packages of one 20 cc. syringe containing 20,000 units.

Dosage.—Initial dose, 10,000 units followed in one hour by a second dose of 20,000 units; the second dose is repeated at intervals of from four to eight hours until the temperature falls and beneficial effects are evident.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 3, 1936

MEDICAL TRUANTS

After years of arduous preparation for the practice of medicine, a physician occasionally finds that his principal talent or interest lies elsewhere and he wanders off into other fields of attainment. This has been true throughout the history of medicine. Some illustrious medical truants have thus been donated to science, to literature, to law and to the state. The late Lord Moynihan [1] cited in his recent Linacre lecture some of the better known medical truants.[2] Copernicus graduated in medicine at Cracow, but he is remembered today as the professor of mathematics who published a treatise on the Revolution of the Planets Around the Sun in 1543. Thomas Linacre himself, the first president of the Royal College of Physicians, and physician to a king, was more highly esteemed as a scholar than as a physician. The great philosopher John Locke graduated in medicine at Oxford and actually engaged in medical practice. His later years were devoted to philosophy and it was he who equipped the Whigs with their political philosophy for the next century. Berzelius, a great chemist, was professor of medicine at Stockholm. John Woodward, who created the first geological museum, received his medical degree from Cambridge and then distinguished himself as a geologist. Malpighi was physician to the Pope, yet he turned to botany and became a pioneer in vegetable microscopic anatomy. The humble doctor's office seems far removed from the Vatican, and yet Dr. Petrus Hispanus actually became Pope John XXI, his pontificate extending from Sept. 8, 1276, to May 20, 1277, when he was killed by a roof collapsing in his palace.[3]

The great botanist Linnaeus held the degree of doctor of medicine from Uppsala. Sir Thomas Hooker graduated in medicine at Glasgow and then went as a physician with the Ross expedition to the antarctic, where he studied the flora so intently that six volumes were required to present his studies. Darwin first propounded his theory of natural selection to Hooker.

Some physicians have given to politics the energy which they first intended for the practice of medicine. The romantic Georges Clemenceau qualified in medicine in 1865, then spent much of his life in politics. He practiced medicine in New York and later in Paris as a specialist in skin diseases; going into politics, he became mayor of Montmartre, a member of the chamber of deputies, a senator and finally the most masterful prime minister of France, serving during the hectic World War to earn the title of savior of his country. The first president of the Chinese Republic, Sun-Yat-Sen, graduated from the College of Medicine in Hong-Kong in 1892. Joseph Warren of Massachusetts was a popular doctor of medicine, who eventually went into politics; he, with Samuel Adams, did much to arouse the spirit of liberty in Massachusetts. It was Dr. Joseph Warren who sent Paul Revere on his famous ride through Arlington, Concord and Lexington, and when news of battle came he rode to the scene of action and later was killed at the battle of Bunker Hill. Leonard Wood, who graduated at Harvard Medical School in 1884, entered the army medical corps and finally became one of the greatest colonial administrators America has produced.

John Keats is a perfect example of the medical truant. His interest was elsewhere even during his student days, when he wrote to a friend:

> The other day during the lecture there came a sunbeam into the room, and with it a whole troop of creatures floating in the ray; and I was off with them to Oberon and fairyland.

Keats became apprenticed to a surgeon and then, though poor, abandoned medicine for literature. Sir Ronald Ross was a poet, but his abiding fame remains in his monumental work on the transmission of malaria. S. Weir Mitchell, the leading American neurologist of his time, has a place in the world of letters near Goldsmith and Holmes, not far below Scott and Lamb.[4] "The tone of his books," said Wister, "is a lesson and a tonic for an age that is sick and weak with literary perverts." Mitchell was the first to describe causalgia, erythromelalgia and postparalytic chorea and, with William Thompson, was the first to emphasize the importance of eyestrain as the cause of headache. When the beloved Dr. Oliver Wendell Holmes was appointed professor of anatomy and physiology at Harvard University, he had so many duties that he said "I occupy not a chair but a whole settee." Holmes did not desert medicine; he made medicine the companion of literature; Lord Moynihan said of his work on puerperal fever published in 1843 that it is "one of the greatest essays ever written in the history of medicine." The German poet Schiller was a graduate in medicine; Goethe, also a great German poet and a biologist, was one of the pioneers of evolu-

1. Moynihan, Lord: Medical Truants, Lancet **1**: 1254 (May 30) 1936.
2. Medical "Truants," Brit. M. J. **1**: 943 (May 9) 1936.
3. Thompson, W. M.: Versatile Men of Medicine, Welfare Magazine **18**: 592 (May) 1927.
4. Garrison, Fielding H.: An Introduction to the History of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1929.

tion. He was the first to use the term "morphology"; and he discovered the intermaxillary bone. Goldsmith, the beloved poet, was a medical graduate, although some writers doubt his right to describe himself as doctor. Goldsmith was for a time physician to the poor at Bankside. He obtained a medical appointment with the East India Company, which later revoked it. He presented himself for examination for hospital physician but again was rejected. Turning then to literature he found immortality, and his Vicar of Wakefield will be read as long as the language lasts.

Edward Jenner, the discoverer of vaccination, was in a minor sense a poet. David Livingstone graduated in medicine, then almost immediately embarked to explore Africa. Hermann von Helmholtz, the mathematical physicist, was educated to be a surgeon in the Prussian army but spent much of his life as professor of anatomy and physiology and of physics. He was the author of the great Handbook of Physiological Optics, which Garrison says is a permanent classic. He invented the ophthalmoscope, the ophthalmometer and the phacoscope. After assuming the chair of physics at the University of Berlin in 1871 he devoted the remainder of his life to the field in which his true genius lay and in which he was equaled, in modern times, only by such men as Lord Kelvin and Clerk Maxwell. It was in Helmholtz's laboratory that Hertz discovered the hertzian waves, which later led to wireless telegraphy. Helmholtz, however, never forgot that he was a physician. "Medicine," he said, with pride, "was once the intellectual home in which I grew up; and even the emigrant best understands and is best understood by his native land." Helmholtz was also a great lover of music and the most prominent of many German scientists of his time who followed music. He not only performed but was the founder [5] of musical esthetics as a science and the author of the most exhaustive treatise on the physical basis of tonal sensations that has ever been achieved. His great work Tonempfindungen was published in 1863. Theodore Billroth, the pioneer of visceral surgery and the greatest German surgeon in his time, was the grandson of a famous soprano. Beneath his calm exterior was the musician and poet. He carried on a lifelong friendship, indeed a sort of musical brotherhood, with the great composer Brahms, the central figure in the famous musical evenings at Billroth's Vienna home. Although John Hunter, a great Scotch surgeon, had no liking for music, his wife, Anne Hunter, was a patron of music and wrote the words for Hayden's Creation.

Lord Moynihan sketched the careers of other medical truants, including Galileo and Sir Thomas Browne; among artists there was Sir Francis Seymour Haden, who was vice president of the Obstetrical Society and founder and first president of the Royal Society of Painter-Etchers. Sir Francis produced 250 works of his own; it is said that as a physician he often made rounds with an etching plate in his pocket. The list is long, including also actors, sportsmen and sculptors, and the evolutionary process is still at work. It has been especially revealed recently in the annual exhibits of hobbies and the avocations enjoyed by hundreds of physicians.

5. Weinfield, Ernest: Medical Men Who Have Attained Fame in Other Fields of Endeavor, Ann. Int. Med. **3**: 1046 (April) 1930.

DISTRIBUTION OF CEVITAMIC ACID IN TISSUES

Progress in many branches of science passes through rather definite steps. The first period is usually characterized by qualitative discoveries and advances of a qualitative nature. This is followed frequently by a period more quantitative in its scope. An excellent example of this general tendency is presented by the case of vitamin C. The earliest work dealt with the existence of such a substance and its qualitative presence or absence in different foods. Subsequently, with the isolation, determination of the chemical structure, synthesis, and development of highly sensitive and rather specific methods for its determination, the problem has changed abruptly into a distinctly quantitative phase. Here again is seen an orderly progression of study. The earlier investigations were of a macroquantitative type, whereas more recent studies have tended to be microquantitative in character. Likewise, in the case of the distribution of cevitamic acid in tissues, the emphasis has shifted in turn from tissues in general to specific organs and, in the most recent work, to a study of the vitamin content of individual cells.

Several years ago, experimental studies demonstrated that practically all tissues of the body contain some vitamin C but that in general the largest amount is present in glandular tissue and the least in muscle tissue and stored fat.[1] Subsequently it was found that different organs vary considerably in their content of cevitamic acid. The adrenal, pituitary, corpus luteum and thymus contain the largest amount of the vitamin, whereas the pancreas, liver, spleen, testis, ovary, brain, thyroid, submaxillary gland and intestinal mucosa contain successively less. Somewhat smaller amounts are present in the kidney, lung and heart. Similar variations in the vitamin C content of different human organs obtained at necropsy have been reported.[1]

In a recent series of investigations [2] the question of the distribution of cevitamic acid within certain organs has been studied in an ingenious manner. Whole glands —adrenal, pituitary, ovary and thymus—were removed from freshly killed cattle and frozen at —5 C. to pre-

1. King, C. G.: Vitamin C, Ascorbic Acid, Physiol. Rev. **16**: 238 (April) 1936.

2. Glick, David, and Biskind, G. R.: The Histochemistry of the Adrenal Gland: I. The Quantitative Distribution of Vitamin C, J. Biol. Chem. **110**: 1 (June) 1935; The Histochemistry of the Hypophysis Cerebri: The Quantitative Distribution of Vitamin C, ibid. **110**: 583 (Aug.) 1935; Studies in Histochemistry: V. The Vitamin C Concentration of the Corpus Luteum with Reference to the Stage of the Estrous Cycle and Pregnancy, ibid. **113**: 27 (Feb.) 1936; Studies in Histochemistry: VII. The Concentration of Vitamin C in the Thymus in Relation to Its Histological Changes at Different Stages of Development and Regression, ibid. **114**: 1 (May) 1936.

vent loss of the vitamin. A small cylindric sample of the frozen tissue was then removed and the specimen was mounted on a freezing microtome and sliced into thin sections, some of which were periodically taken for analysis by a microchemical method, sensitive to ±0.0001 mg. of the vitamin. This procedure permitted a study of restricted portions of the gland and indeed, in certain instances, of the different types of cells themselves. It was observed that the vitamin C content of the tissue taken from the fascicular zone of the adrenal cortex was nearly twice that of the same-sized slices taken from the medulla. In order to determine whether the difference was actual or only apparent because of the presence in the medulla of structures, such as nerves and vascular spaces, containing only small amounts of the vitamin, cell counts were made in the various areas and from these values the cevitamic acid content of the individual parenchymal cells was estimated. The actual amount of the vitamin present in the relatively small fascicular cortical cell was still significantly greater than that present in the larger medullary cell. A similar type of study of the pituitary demonstrated that an exceedingly high concentration of vitamin C was present in the pars intermedia. Indeed, the concentration of the vitamin in this portion of the pituitary, according to the authors, is the highest of any tissue yet recorded, being some 1.5 times greater than that in the cells of either the pars distalis of the pituitary or the adrenal cortex.

The concentration of cevitamic acid in the corpus luteum and the thymus was likewise determined by the same method and an attempt was made to detect possible changes with age and physiologic activity. The quantity present in the corpus luteum was found to be at a maximum in the fully mature organ, a decrease occurring during the period of involution and atrophy. It is of interest to note that the fluctuations in the vitamin content of the corpus luteum parallel to a striking degree the changes in the amount of the luteal hormone, progesterone, present in the gland. There is some indication, it is pointed out, that this relationship may be more than a casual one. In the case of the thymus, the amount of cevitamic acid in the gland of the calf or the fetus exceeds that present in the glands of cows and bulls. However, the apparent decrease with age was shown to be due to the displacement of active glandular tissue by fat and connective tissue during involution. There was no significant decrease in the concentration of the vitamin in the glandular cells themselves.

Searching studies of this type have more than academic significance. Not only will they yield knowledge of fundamental value in elucidating the question of the function of vitamin C in the animal organism, but now that the chemical properties of cevitamic acid have become known, such investigations will point out more clearly the specific function of the organ or cell in question.

SURGICAL EXAMINATIONS AND THE INTERNATIONAL COLLEGE OF SURGEONS

Announcements, now widely circulated to the American medical press, indicate that the International College of Surgeons, discussed in our editorial columns [1] on June 20, is about to conduct examinations for membership and fellowship for those who apply and indicate their willingness to pay $250 for the purpose. Thus it now becomes possible for a young man who wishes to find out whether or not he is a surgeon to obtain the information from three or more sources. He may submit his credentials and take the examination afforded by the American College of Surgeons, he may undertake a similar process in relationship to the International College of Surgeons, or he may no doubt within the near future apply for examination and certification by the Certifying Board in Surgery, which is in process of formation.

Subsequent to the publication of the current comment already referred to, the International College of Surgeons made available a roster of state regents, specialty regents and fellows, who apparently accepted the nominations given them with the understanding that they would not be requested to invest financially in their honors. There are indications that a considerable number of these "lead horses" subsequently became aware of the extraordinary nature of the organization by which they had been honored and intimated a desire to relinquish the special recognition which had been conferred on them. No doubt they should be free from condemnation in view of the fact that many American and foreign leaders whose names were associated with the prospectus were persons of high repute and distinction in American and foreign surgery, whose names in themselves should be warrant of scientific merit. Nevertheless, some others apparently felt the new organization a suitable substitute specially designed for the benefit of those who have failed to meet the requirements of the well established International Society of Surgery. In the general news columns of this issue of THE JOURNAL appears an announcement of the International Society of Surgery with regard to its next meeting in Vienna in September 1938.

What are the difficulties primarily concerned in the promotion of the new International College of Surgeons? As was pointed out in our original current comment, there seems to be no good evidence that such a body will meet any need not already provided for by established organizations. The proposals for an international museum of surgery in Geneva and for international reciprocity, the committee to restrict the publication of unestablished surgical material, the building to be erected and the higher degrees are, to say the least, grandiloquent conceptions. The automatic selection of 300 American surgeons by a self-constituted

1. The International College of Surgeons—Why? Current Comment, J. A. M. A. **106**: 2162 (June 20) 1936.

body is in itself no guaranty of competence in those who will pay $250 for the examination. The International Society of Surgery during thirty-one years has already selected 125 leading American surgeons for 150 places available to American surgeons of established prestige. Is it to be considered that any considerable number of surgeons will care to avail themselves of membership, fellowship, mastership or any of the other distinctions to be conferred by both these organizations? Finally, what can the International College of Surgeons have to offer beyond the prestige already available through the certificate of fellowship in the American College of Surgeons or the certificate to be made available by the new Certifying Board?

To the average American physician it may appear that THE JOURNAL is concerning itself unduly in this matter. The problem of multiple medical organizations in various fields is one that has concerned leaders in American medicine for many years. Readers will recall previous editorials in relationship to the American Medical Editors' and Authors' Association. Certainly it is within the province of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION to make American physicians aware of the conditions surrounding any effort or organization which makes a distinct appeal for the funds of American physicians. Those who have contemplated application to the International College of Surgeons for one of the examinations to be offered in various portions of the United States and Canada under the auspices of local regents may well consider the value of the return which they are likely to receive for their investment.

Current Comment

DISTRIBUTION AND HOSTS OF THE HUMAN FLEA

With the recent recognition of sylvatic plague in Montana and Oregon, data on the distribution and host relationships of fleas in these states, particularly those species known to attack man, assume a new and important interest. For this reason, records which show the association of the human flea Pulex irritans L. with plague-susceptible native rodents, wild carnivores, game animals and household pets within these states are of particular value. Data of this type have been recently presented by Jellison and Kohls [1] of the United States Public Health Service. The records show particularly that Pulex irritans is well established in many parts of Montana. In the search for possible hosts it has been possible definitely to identify Pulex irritans obtained from prairie dogs, domestic dogs, coyotes (Canis latrans) and deer (Odocoileus Sp.). Evidently this flea may occur frequently on coyotes in other Western states, as collections made from this host in Colorado, in Oregon and in California have contained specimens of Pulex irritans. These preliminary observations indicate that, in view of the diverse host data and the number of locality records that have been obtained in a relatively brief period, Pulex irritans has been a well established species in these regions for some time. Further field studies will undoubtedly increase the list of host animals as well as add extensively to the data regarding additional details of the life history of this parasite.

1. Jellison, W. L., and Kohls, G. M.: Pub. Health Rep. **51**: 842 (June 26) 1936.

Medical Economics

THE STUDY OF CONSUMER PURCHASES

A New Survey of Family Expenditures

A new study of consumer purchases now in progress is planned to provide facts concerning medical costs free from propaganda. It is the most comprehensive survey ever made of American family expenditures. It is to include 52,000 families at all income levels and in all occupations.

The actual fact gathering has been divided between two federal government organizations. The U. S. Bureau of Labor Statistics is conducting the survey in urban centers and the U. S. Bureau of Home Economics is surveying agricultural areas. Plans for the study were formulated by a committee of representative economists in cooperation with the National Pesources Committee. They follow the lines proposed by the Social Science Research Council in 1929 and suggestions made by the Chamber of Commerce of the United States in 1932.

As a result of this study, it is said, the medical profession will be able to learn the relation of family expenditures for medical care to expenditures for other specific goods and services; how this relationship varies with annual incomes ranging from $250 to $10,000 a year and over; how the occupation of the principal wage earner, the size of the family and the amount of the income influence the family's selection among the various types of medical care; how expenditures differ among rural and urban families; whether an urban family with a rural background is more likely to turn to specialists than a city-bred family, or whether the number of members in the family and the amount of the income play a more important part in the selection of medical services.

The detailed information which the 52,000 families are giving will not be lumped together in a mythical "average." The data are being analyzed by geographic areas for thirteen income groups, eleven types of family composition and seven occupational classifications (such as wage earners, salaried and independent businesses and professions, and retired persons).

This should make it possible to learn who calls on the services of physicians, dentists, ophthalmologists and other specialists; who visits clinics; how much money families in each of these classifications are spending for hospitalization, private nurses and visiting nurses, and what their expenditures are for medicines and drugs, medical appliances and supplies, eye glasses, and health and accident insurance.

These facts will be presented in relation to other family expenditures for food, clothing, shelter, household furnishings and equipment, education, recreation, travel, tobacco, reading, gifts, automobiles and personal care. In addition, changes in family assets and liabilities during the year will be analyzed, so it will be possible to learn the relation between expenditures for medical care and family savings or debts.

Organizations of manufacturers, retailers, advertising agencies and newspapers have shown great interest in the study because of its significance as a comprehensive market research survey. Obviously it will be equally significant for the medical profession in attacking the problems of medical economics and planning for the education of specialists and the location of hospitals. It provides the kind of accurate and objective data needed as the basis for future professional policies.

Such a study as this cannot be truly representative or of maximum usefulness to all groups unless individuals in all groups cooperate. This fact has been recognized by all who have understood the purposes of the study. The economists who planned the study estimated that about 15 per cent of the persons concerned would be unable or unwilling to participate in completion of the short interviews. Instead, the percentage of

"refusals" has averaged 2.9 per cent. For the longer interview the "refusals" have averaged 11.5 per cent instead of the 25 per cent estimated.

The selected families of wage earners, retired persons, salaried and independent business men and members of various professions are giving information that will be of great value to the medical profession. The departments involved request the medical profession for similar cooperation. The ultimate usefulness of the study depends of course on the cooperation of the families in each business and professional group and on that of the medical profession.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Deaths from Poliomyelitis.—One death reported during the week ended September 25 brings the total number of deaths from infantile paralysis in the Alabama outbreak to twenty-six. For several weeks the total has remained at twenty-five. The total number of cases reported during the period January 1 to September 25 is 354, an increase of eight cases since the preceding report. For the period January 1-September 18 there were 346 cases. For the period ended September 11, 335 cases were recorded. The incidence continues to be heaviest in Jefferson, Lauderdale, Morgan, Franklin, Limestone and Cullman counties, with sporadic cases appearing throughout the state.

CALIFORNIA

Health at San Diego.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of thirty-seven million, for the week ended September 19, indicate that the highest mortality rate (16.6) appears for San Diego and the rate for the group of cities as a whole, 10. The mortality rate for San Diego for the corresponding period last year was 13.5 and for the group of cities, 10.3. The annual rate for eighty-six cities for the thirty-eight weeks of 1936 is 12.3, as against a rate of 11.5 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

State Association News.—The public health institutes sponsored by the California Medical Association will be conducted in Monterey, October 7-11; San Francisco, October 14-17. The first one opened in Santa Barbara, October 2, to continue to the twenty-fourth. The November itinerary will cover the San Joaquin Valley. Visualization exhibits, which were part of the display in the Hall of Medical Science of the San Diego Exposition, will be shown in connection with the institutes. Drs. Edward M. Pallette, Los Angeles, Howard Morrow, San Francisco, and Frederick C. Warnshuis, San Francisco, respectively president, president-elect and secretary of the state association, will inaugurate their annual visits to county societies, October 7-10, when five county units will be visited in the upper Sacramento Valley.——Not one of the twenty-two state initiatives appearing on the November ballot relate to medicine, medical care, insurance or health legislation.

COLORADO

Personal.—Colorado College recently conferred the honorary degree of doctor of science on Dr. Gerald B. Webb, Colorado Springs.

Society News.—Dr. Moses Paulson, Baltimore, addressed the Denver Society of Internal Medicine, August 17, on "Newer Aspects of Gallbladder Disease, Regional Ileitis and Ulcerative Colitis."——At a meeting of the Medical Society of the City and County of Denver, September 1, Drs. Joseph J. Reilly and Clifford L. Wilmoth, both of Denver, spoke on "Myasthenia Gravis" and "Inguinal Hernia" respectively.——At a meeting of the Northeast Colorado Medical Society in Sterling, September 4, Dr. Vera Heinly Jones, Denver, discussed the state public health program.——Dr. John C. Pounden, Cedaredge, addressed the Delta County Medical Society, August 28, on "Health Insurance in England."

DELAWARE

State Medical Meeting at Rehoboth, October 12-14.—The Medical Society of Delaware will hold its annual convention in Rehoboth, October 12-14, with headquarters at the Belhaven Hotel, under the presidency of Dr. Joseph B. Waples Jr., Georgetown. Speakers will include:

Dr. William F. Bonner, Wilmington, Bronchiectasis.
Dr. Ervin L. Stambaugh, Lewes, Acute Appendicitis.
Dr. Arthur C. Jost, Dover, Diphtheria Immunization in Children.
Dr. John W. Burke, Washington, D. C., Facts, Fads and Fancies of Oph.halmology.
Dr. Thomas Grier Miller, Philadelphia, Diagnosis and Management of Gallbladder Disease.
Dr. Bartholomew M. Allen, Wilmington, Results of Gallbladder Examinations by Varying X-Ray Technic.
Dr. Thaddeus L. Montgomery, Philadelphia, Obstetric Anesthesia and Analgesia: Its Effect on the Third Stage of Labor.
Dr. Ira Burns, Wilmington, Recent Advances in Radiotherapy.
Dr. Lawrence J. Rigney, Wilmington, Diagnostic Features of Some Gastro-Intestinal Conditions.

At the meeting of the woman's auxiliary, October 14, Miss Etta Wilson of the Delaware Children's Association will be guest speaker.

DISTRICT OF COLUMBIA

Dr. Boone Honored.—Dr. Joel T. Boone, commander of the naval hospital, San Diego, Calif., has been awarded the Legion of Honor Medal, the highest award of the French government, for extraordinary valor and courage during the World War. Dr. Boone, who was White House physician to Presidents Harding, Coolidge for a part of his term, and Hoover from 1929 to 1933, has been a naval medical officer since 1914. Dr. Boone has been awarded the Congressional Medal of Honor and the Distinguished Service Cross from the United States.

GEORGIA

Society News.—At a meeting of the Fulton County Medical Society in Atlanta, September 17, Dr. James G. McDaniel, Atlanta, read a paper entitled "A Comparative Study of Syphilitics and Nonsyphilitics on Fulton County Relief Rolls."——Dr. Kennon C. Walden, Waycross, addressed the Ware County Medical Society in Waycross, August 5, on diseases of the gallbladder.——At a meeting of the Coffee County Medical Society in Douglas, August 25, Dr. Alton M. Johnson, Valdosta, spoke on "Pylorospasm in Infancy."——Speakers before the Fourth District Medical Society at Warm Springs, August 10, included Drs. Arthur Neal Owens, New Orleans, on "Principles of Plastic Surgery as Applied to the Immediate Handling of Accidents"; Wilmer Baker, New Orleans, "Handling of Accidents Occurring During the Administration of Anesthesia"; Launcelot Minor Blackford, Atlanta, "Cardiac Pain," and Frank K. Boland, Atlanta, "Immediate Care of Fractures."——Dr. Loren Gary Jr., Shellman, addressed the Randolph County Medical Society in Cuthbert, September 3, on the diagnosis and treatment of early syphilis.

ILLINOIS

Society News.—The McDonough County Medical Society was addressed at Macomb, September 24, by Drs. William J. Pickett, Chicago, on thyroid surgery; Joseph E. F. Laibe, Chicago, hematuria, and Robert S. Berghoff, Chicago, diseases of the heart. Dr. Berghoff also conducted a heart clinic.——Dr. Margarete M. H. Kunde, Chicago, discussed endocrine therapy before the Iroquois County Medical Society at Watseka, September 24.——At a meeting of the DuPage County Medical Society, September 23, Dr. Max Thorek, Chicago, discussed "Photography as a Doctor's Hobby."——The Hancock County Medical Society was addressed, September 14, by Drs. Charles P. Blair, Monmouth, on "Fractures of the Spine" and Harold M. Camp, Monmouth, "The County Medical Society and the Community."

Chicago

Lectures on Psychoanalysis.—Among other lectures and seminars, the Institute for Psychoanalysis offers the following during the first quarter of 1936-1937:

Drs. Franz G. Alexander and Thomas M. French, Psychoanalytic Interpretation of Psychotic Cases.
Dr. Helen Vincent McLean, Application of Psychoanalysis to Literature.
Drs. Catherine C. L. Bacon and Leon J. Saul, Case Seminar for Psychiatric Social Workers.

Branch Meetings.—At a meeting of the Englewood branch of the Chicago Medical Society, October 6, Dr. Rosco G. Leland, director, Bureau of Medical Economics, American Medical Association, will speak on medical economics and Dr. Olin West, Secretary of the Association, will open the discussion. Dr. Emil Novak, Baltimore, addressed the Aux Plaines branch, September 25, on "Cause and Treatment of Functional Uterine Bleeding."

IOWA

Neuropsychiatric Meeting.—The fifteenth annual convention of the Central Neuropsychiatric Association will be held in Iowa City, October 9-10. Scientific sessions will be held in the medical amphitheater of the University Hospital, with headquarters at the Jefferson Hotel. Speakers, all of Iowa City except Dr. Doolittle, will include:

Dr. William L. Woods, Qualitative Analysis of Deterioration in Schizophrenia and Organic Psychoses.
Dr. William Malamud, Psychasthenia.
Dr. Erich Lindemann, Pharmacodynamic Studies in Relation to Neurophysiology and Psychopathology.
Dr. Stephen Weisz, Studies in Equilibrium Reaction.
Lee E. Travis, Ph.D., Berger Brain Rhythms in Neuropsychiatric Cases.
Emil Witschi, Ph.D., Hypophyseal Tumors Caused by Ovarian Hyperfunction.
Dr. Charles G. Barer, Torula Infection of Central Nervous System.
Drs. Harold W. Lovell and Harold D. Kerr, Encephalography in Schizophrenia.
Prof. Rollin M. Perkins, S.J.D., Legal Aspects of Neuropsychiatry.
Dr. Russell C. Doolittle, Des Moines, The Scope of the Private Sanatorium.
Dr. Adolph L. Sahs, Dietary Factors in Polyneuritis.
Dr. Olan R. Hyndman, Neurosurgical Cases of Special Neurologic Interest.

The annual banquet will be held Friday evening with Dr. John F. Fulton, Yale University, New Haven, Conn., as the guest speaker. His subject will be "Autonomic Function Controlled by the Cerebral Cortex."

MAINE

Society News.—At a meeting of the Hancock County Medical Society in Bar Harbor, August 25, Drs. Fritz B. Talbot, Boston, and Martin H. Fischer, Cincinnati, discussed "Benefits of Water in Infancy" and "Nephritis" respectively.——Dr. Charles Hendee Smith, New York, addressed the Somerset County Medical Society in Lakewood, August 7, among others, on infant feeding.——The Washington County Medical Society was addressed in Calais, August 21, by Prof. Francis G. Benedict, Boston, on "Physiology of the Elephant," and Drs. Russell J. Collins, East St. John, N. B., and George F. Skinner, St. John, N. B., on medical and surgical treatment of tuberculosis, respectively.

Annual Fall Clinical Session.—The fourth annual fall clinical session of the Maine Medical Association will be held in Waterville, October 15-16, with headquarters at the Elmwood Hotel. The clinical demonstration and conferences will be held during the mornings and afternoons of both days at the Central Maine Sanatorium, Fairfield, the Elm City Hospital, the Sisters' Hospital and Thayer Hospital. Each day will be divided into four periods, with eight clinics to each period. Thursday evening the Kennebec County Medical Association will hold its regular monthly meeting; the program will consist of a panel discussion on poliomyelitis with Drs. John A. Kolmer, Philadelphia, Josephine B. Neal, New York, and William Lloyd Aycock and Arthur T. Legg, Boston, as the speakers. The program Friday evening will be under the auspices of the committee on medical economics of the Maine Medical Association.

MASSACHUSETTS

Ether Day.—Dr. Paul Dudley White, assistant professor of medicine, Harvard Medical School, will deliver the principal address at the observance of Ether Day at Massachusetts General Hospital, October 16. A scientific program will follow a buffet luncheon.

Chair in Legal Medicine Named for Dr. Magrath.—"The George Burgess Magrath Endowment for Legal Medicine" will be established at Harvard Medical School, Boston, with a gift of $250,000 by Mrs. Frances Glessner Lee of Chicago and Littleton, N. H., according to the New York *Times*. The gift commemorates her late brother, John G. M. Glessner, and his classmate at Harvard in 1894, Dr. George Burgess Magrath, medical examiner of Suffolk County since 1907. In that year Dr. Magrath became instructor in legal medicine, a position he held until 1931, when he was named professor. He is 66 years of age.

MINNESOTA

Society News.—Dr. John H. J. Upham, Columbus, President-Elect, American Medical Association, discussed medical economics at the Mayo Clinic, Rochester, August 21.——Edgar Allen, Ph.D., professor of anatomy, Yale University School of Medicine, New Haven, addressed a special staff meeting of the Mayo Clinic, Rochester, September 10, on "Hormones in Relation to the Development of Malignant Disease" and Howard B. Andervont, Sc.D., biologist, U. S. Public Health Service, "Carcinogenetic Substances." Others on the program included Drs. Warren H. Lewis, department of embryology, Carnegie Institution of Washington, and Henri Coutard, chief, department of x-ray therapy for cancer, Radium Institute of the University of Paris.

Naturopath Sentenced to Prison for Abortion.—George R. Viger, Minneapolis, pleaded guilty in the district court of Ramsey County, September 15, to performing an abortion and was sentenced to a term of not to exceed four years in the state prison, according to the state medical board. Viger was arrested August 7, following the death of a 27 year old woman at Ancker Hospital, St. Paul. Prior to 1931 Viger maintained an office in the Bremer Arcade in St. Paul, representing himself as a naturopathic physician. He was arrested on a charge of practicing healing without a basic science certificate and pleaded guilty, Dec. 10, 1930. He was sentenced to pay a fine of $200 and to serve a year in the St. Paul workhouse. The fine was paid and the sentence suspended on condition that he refrain from practicing healing. He closed his office after informing the court that he was moving to Texas. He did not leave the state and at the time of his last arrest was found to be living at a Minneapolis hotel.

MISSISSIPPI

Society News.—Speakers before the Northeast Mississippi Thirteen Counties Medical Society at Amory, September 15, included Drs. Robert A. Strong, New Orleans, on "Nutritional Requirements in Infancy"; Wade H. Sutherland, Booneville, "Tuberculosis a Surgical Disease"; Harvey F. Garrison, Jackson, "Immunization"; Richard A. Street Jr., Vicksburg, "Suprarenal Cortex Hormone," and Stanley A. Hill, Corinth, "Diagnosis of Uterine Hemorrhage."——Dr. Hiram W. Kostmayer, New Orleans, addressed the Central Medical Society, September 1, on "Endocrines in Gynecology."——At a special session of the state legislature recently, an appropriation of $36,000 was approved to continue the two year medical school at the University of Mississippi.

Clinics for Crippled Children.—The crippled children's service of the state vocational board, cooperating with the state board of health, has arranged a series of clinics to care for children in Mississippi crippled by infantile paralysis since June 1. The first clinic was held, September 16, in Iuka for patients in Tishomingo County; the second at Corinth, September 18, for patients in Alcorn, Tippah and Prentiss counties; the third at Columbus, September 24; at Tupelo, September 26. A clinic is scheduled for Clarksdale, October 3. Scattered cases in central and southern Mississippi will be cared for early in October. These clinics are purely to apply braces, splints and such apparatus to prevent as much deformity as possible and minimize the amount of operating needed later to give the children useful limbs. Since the last legislature did not make the necessary appropriation for matching federal funds for crippled children's service, an appeal was made to Dr. William DeKleine, Washington, D. C., medical director, American National Red Cross, who allotted $2,625; a similar amount was then obtained from the federal government, and the combined total will be used to finance the program.

MISSOURI

Public Health Program at Clinical Conference.—A public health meeting, Monday evening, will be a feature of the Kansas City Southwest Fall Clinical Conference, October 4-8. Speakers will be Drs. Jay Arthur Myers, Minneapolis; Milton A. Bridges, New York, and Morris Fishbein, Chicago, editor of THE JOURNAL. Their subjects will be respectively "Driving Tuberculosis from Our Midst," "Facts and Fallacies Regarding Food and Diet," and "Your Heart and Your Life." A news item about the conference appeared in THE JOURNAL, September 12, page 883.

NEW YORK

District Meetings.—The annual meeting of the Sixth District Branch of the Medical Society of the State of New York was held in Ithaca September 17. Drs. Chevalier Jackson and Chevalier L. Jackson, Philadelphia, presented a paper on "Diseases of the Lungs" and Dr. John C. M. Brust, Syracuse, "Diagnosis and Treatment of Anal Abscess and Fistula." Drs. Stafford L. Warren and Charles M. Carpenter, Rochester, displayed colored motion pictures on heat treatment of gonorrheal infections; Dr. William A. Brumfield Jr., Albany, of the state health department, discussed the state syphilis control program and Dr. John K. Deegan, Albany, described the new

Hermann M. Biggs Memorial Hospital, Ithaca. Addresses on state society affairs were made by Drs. Floyd S. Winslow, Rochester, president; David J. Kaliski, New York, chairman of the workmen's compensation bureau, and Peter Irving, New York, secretary. —— These officers of the state society and Dr. Frederic E. Elliott, Brooklyn, chairman of the committee on economics, also addressed the annual meeting of the Seventh District Branch at Willard September 24. Drs. Arthur Krida, New York, and William J. Merle Scott, Rochester, spoke on "Surgery of the Knee Joint" and "Differentiation of Benign and Malignant Lesions in the Gastro-Intestinal Tract." Dr. Ross E. Herold, clinical director of the Willard State Hospital, conducted a dry clinic and Dr. Edward G. Winkler, Buffalo, presented a motion picture showing various procedures in gynecology.

New York City

First Harvey Lecture.—Dr. Wilder G. Penfield, professor of neurology and neurologic surgery, McGill University Faculty of Medicine, Montreal, will deliver the first Harvey Lecture of the season at the New York Academy of Medicine, October 15. His subject will be "The Relation of the Cerebral Cortex to Consciousness."

The Academy's Ninth Graduate Fortnight. — The New York Academy of Medicine will present its ninth annual graduate fortnight during the two weeks October 19-31 on "Trauma, Occupational Diseases and Hazards." Clinics will be held in various hospitals from Monday to Friday each week in the afternoons, and scientific addresses will be delivered each evening at the academy building. Dr. Henry E. Sigerist, professor of the history of medicine, Johns Hopkins University School of Medicine, Baltimore, will deliver the Wesley M. Carpenter Lecture Monday evening October 19, on "The Historical Background of Industrial and Occupational Disease." On a special program arranged by the Medical Society of the County of New York for Monday evening October 26, Hon. Bernard L. Shientag and Hon. Meier Steinbrink, justices of the state supreme court, will discuss "The Workmen's Compensation Law: Its History and the Lessons It Holds for the Future" and "The Medical Witness" respectively. Among other speakers will be:

Dr. Alfred Blalock, Nashville, Tenn., Shock and Hemorrhage.
Dr. Marvin A. Stevens, New Haven, Conn., Hazards in Athletics.
Dr. Alice Hamilton, Boston, Medicolegal Aspects of Industrial Poisonings.
Dr. Temple S. Fay, Philadelphia, Results of Treatment of Cerebral Trauma Based upon the Laws of Cerebral Hydrodynamics.
Dr. John J. Moorhead, Accidents and Their Management.
Dr. Robert H. Kennedy, The Medical Problem in First Aid.
Dr. Foster Kennedy, Fatigue and Noise in Industry.
Dr. James Ewing, Relation of Trauma to Malignant Tumors.
Dr. William Darrach, General Principles of Fracture Treatment.
Dr. James M. Hitzrot, Hand Injuries.
Dr. Frederic W. Bancroft, Burns: Thermal and Electrical, Radiant and Chemical.
Alexander O. Gettler, Ph.D., Toxicology of Industrial Poisonings.
Dr. Byron P. Stookey, Nonoperative versus Operative Treatment of Spinal Cord Injuries Associated with Vertebral Fractures and Dislocations.
Dr. Arthur M. Wright, Trauma of the Abdomen.
Dr. Francis B. Berry, Trauma of the Chest.
Dr. George F. Cahill, Trauma Involving the Kidney, the Ureter and the Bladder.

Thursday evening, October 22, speakers will be Major Samuel A. White, medical corps, U. S. Army, on "Medical Aspects of Chemical Warfare"; Col. Adelno Gibson, U. S. Army, "Chemical Warfare as Developed During the World War—Probable Future Development," and Dr. Henry H. M. Lyle, "Treatment of Injuries Caused by High Explosives." The following evening the program will be on the relation of trauma to diabetes, discussed by Dr. Elliott P. Joslin, Boston; pulmonary disease, Dr. James Burns Amberson Jr.; cardiovascular disease, Dr. Bernard S. Oppenheimer, and the nervous system, Dr. Israel Strauss.

PENNSYLVANIA

Unlicensed Practitioner Fined.—Mike White of Washington County was convicted September 8 of practicing medicine without a license. A $250 fine and costs or ninety days in jail was imposed. The case was handled through the division of law enforcement of the state department of public instruction, of which the state board of medical education and licensure is a part.

Philadelphia

Society News.—The first fall meeting of the Philadelphia County Medical Society was held September 23. Dr. Francis Ashley Faught was installed as president, succeeding Dr. George C. Yeager.——The Philadelphia Laryngological Society celebrated its twenty-fifth anniversary September 15.——Dr. Walter Schiller, assistant at the Frauenklinik, University of Vienna, addressed the Obstetrical Society of Philadelphia, September 24, on "Early Diagnosis of Carcinoma of the Cervix."

Dr. Anders' Will.—Dr. James M. Anders, who died August 29, provided in his will that after the death of his widow $50,000 of his estate is to go to the University of Pennsylvania to establish the James M. Anders Foundation in the Graduate School of Medicine. Dr. Anders also bequeathed $2,500 to the Philadelphia County Medical Society to defray the expenses of the annual "Public Health Day" in the public schools; $2,000 for the endowment fund of the society's library, and such books from his library as the library committee may select.

RHODE ISLAND

Division of Industrial Hygiene.—The state department of health has established a division of industrial hygiene through funds available under the social security act. Dr. James Philip Deery, Wallum Lake, is director of the division and Dr. William A. Mahoney, Providence, assistant director. Dr. Deery was graduated from Georgetown University School of Medicine, Washington, D. C., in 1932 and Dr. Mahoney from Tufts College Medical School, Boston, in 1919.

Society News. — The Providence Medical Club made its second annual pilgrimage August 19 to the home of Dr. William Hunter, who in 1755-1756 delivered at Newport the first systematic series of medical lectures in this country. The club was entertained by Miss Anna Falconet Hunter, great-great-granddaughter of Dr. Hunter, and visited the site of his apothecary, the house in which he lived, the Newport Historical Society, where many memorials of him are preserved, and the churchyard where he was buried in 1777, at the age of 47.

UTAH

Plague Infection.—Under date of August 24, plague infection was reported in fleas taken from twenty-three prairie dogs, Cynomys parvidens, shot on a ranch two miles east of Hatch, Garfield County. Plague infection was reported, under date of August 26, to have been proved by mass inoculation of material from two prairie dogs shot August 6 on a ranch five miles northeast of Panguitch, Garfield County, according to *Public Health Reports.*

VIRGINIA

State Medical Meeting at Staunton.—The sixty-seventh annual session of the Medical Society of Virginia will be held at Staunton, October 13-15, with headquarters at the Hotel Stonewall Jackson. Dr. William D. Haggard, Nashville, Tenn., will give an address at the opening general session; Dr. Lloyd W. Ketron, Baltimore, will address a general session Wednesday on "Tuberculosis of the Skin," at which Dr. Philip St. L. Moncure, Norfolk, will give his presidential address, on "The South in Medicine and Surgery." Virginia speakers on the program will include:

Dr. Harvey B. Haag, Richmond, Studies on the Persistence of Action of Digitalis and Digitalis Bodies.
Dr. Walter B. Martin, Norfolk, Adhesive Pericarditis with Decompensation: Treatment by Evulsion of the Left Phrenic Nerve.
Dr. Emmette T. Gatewood, Richmond, Bronchoscopic Observation of Laryngotracheobronchitis in Children with Obstructive Dyspnea.
Dr. Charles W. Putney, Staunton, Treatment of Fractures of Long Bones by Use of an Improved Fracture Reducing Frame.
Drs. John H. Neff and Edgar W. Kirby Jr., University, Prostatic Obstruction.
Dr. William Lowndes Peple, Richmond, Radium in Treatment of Nonmalignant Diseases of the Uterus.
Dr. Linwood D. Keyser, Roanoke, Stone in the Urinary Tract.

There will be a symposium on endocrine diseases presented by Drs. Edward L. Alexander, Newport News; Charles J. Andrews, Norfolk, and Edwin P. Lehman, University.

WASHINGTON

Society News.—Dr. James W. Henderson, Longview, was elected president of the Public Health League of Washington at the annual meeting September 1 in Yakima.——Dr. Howard B. Kellogg addressed the King County Medical Society, Seattle, October 5, on "Regional Ileitis," and Drs. Donald V. Trueblood, Clyde R. Jensen and Terence T. Dawson gave a five-year report of the tumor clinic at the King County Hospital.

WISCONSIN

State Medical Election. — Dr. James C. Sargent, Milwaukee, was chosen president-elect of the State Medical Society of Wisconsin at the annual meeting in Madison September 10, and Dr. Stephen E. Gavin, Fond du Lac, was installed as president. The 1937 meeting will be in Milwaukee.

GENERAL

Poliomyelitis Closes Schools. — Opening of schools in Ashtabula, Ohio, was deferred because six cases of poliomyelitis were reported in the city September 8.——Schools in West Pottsgrove, Pa., were closed September 10, for several days, after a case of infantile paralysis was found in a family with several children of school age.

Decline in Appendicitis Death Rate.—A steady decline in the mortality rate from appendicitis among industrial policyholders of the Metropolitan Life Insurance Company has been noted in the five year period 1931-1935, according to the *Statistical Bulletin*. In the age group 1 to 74, the rate dropped steadily from 14.3 per hundred thousand in 1931 to 11.5 in 1935, a decrease of 20 per cent. Among white male policyholders the rate last year, 13.5 per hundred thousand, was the lowest recorded in this group since 1919, while the rate among white women policyholders was the lowest registered in twenty-five years. Provisional figures for the first seven months of 1936 indicate that the death rate from appendicitis will drop to an even lower level this year than in 1935. In the period 1931-1935 the death rate was the highest (21.1) for white male policyholders in the age group 65-74, the same age group showing the highest rate (19) among white women policyholders.

Cancer Death Rate for 1935 Highest on Record.—In a recent analysis of deaths from cancer, Frederick L. Hoffman, LL.D., Biochemical Research Foundation of the Franklin Institute, Philadelphia, points out that the cancer death rate for 184 cities with a population in 1935 of nearly 46,000,000 was 125.6 per hundred thousand of population against a rate of 123.1 in 1934, establishing the highest death rate from this cause since records have been carefully observed. The actual number of deaths in the 184 cities increased from 55,201 in 1934 to 57,309 in 1935, while 107 cities reported increases and seventy-seven decreases in their cancer death rates. The ten cities with the highest cancer death rates were Madison, Wis., 286.8; Concord, N. H., 238.4; Portland, Me., 229.4; Pasadena, Calif., 218; Troy, N. Y., 187.6; Boston, 187.3; Shreveport, La., 185.2; Pittsfield, Mass., 183.5; Spokane, Wash., 182.8, and Quincy, Ill., 178. In the five largest American cities, Chicago, Detroit, Los Angeles, New York and Philadelphia, the highest rate (147.5) was returned for Philadelphia. Detroit was the only city in this group to show a decrease (67.8). Presenting comparative rates in certain foreign countries, Dr. Hoffman points out that Switzerland reported an increase from 115.8 per hundred thousand of population in 1907 to 147.3 in 1934. Death rates, based on specified types, were 43.2 per thousand for cancer of the female genital organs in single women (25 years old and over), compared with 64.6 for married, widowed and divorced women. For cancer of the breast the rate for single women was 54.6, and for married, widowed and divorced women it was 49.1.

The International Society of Surgery.—The International Society of Surgery, founded in 1905 at Brussels through the initiative of the Belgian Surgical Society under the leadership of Drs. Charles Willems of Ghent and A. Depage of the University of Brussels and surgeon in chief of the Belgian army, will hold its next session in Vienna in September 1938. The society now has nearly 2,000 members, who represent forty-five nations. Fellowship is obtained solely by recognized professional merit based on the recommendation and endorsement of a national committee on credentials in each of the constituent countries. A triennial congress is held. The scientific program continues for three days and is devoted mainly to the discussion of live and controversial questions of immediate importance to the profession. These subjects are selected long in advance by an international committee, to be debated by essayists or rapporteurs selected from the five countries whose languages are officially recognized by the congress. The essays are translated into five languages (French, English, German, Italian, Slav [Polish] and Spanish) and distributed to the fellows long in advance of the congress. The affairs of the society are managed by a council consisting of representatives elected by the delegates of each one of the constituent countries with the aid of an executive committee or bureau permanently established in Brussels, consisting of an executive chairman (Professor Verhoogen), the secretary general (Dr. Mayer), the treasurer (Dr. P. Lorthioir), and the president and vice presidents as ex officio members. Dr. Leopold Mayer of Brussels has been the general secretary during the thirty-one years of its existence. The World War suspended the activities of the society from 1914 to 1920, when the fifth congress was held in Paris under the presidency of Prof. W. W. Keen of Philadelphia. Thus far the congresses have been held in Brussels, New York, Paris, London, Rome, Warsaw, Madrid and Cairo. Its presidents have been Kocher of Berne, Czerny of Heidelberg, Lucas-Championnière of Paris, Depage of Brussels, Keen of Philadelphia, Macewen of Glasgow, Giordano of Venice, Hartman of Paris, de Quervain of Berne, von Eiselsberg of Vienna and Rudolph Matas of New Orleans. Dr. Lorthioir of Brussels, who had been the treasurer of the society since its foundation, was elected at Warsaw but died before he could preside at Madrid in 1932 and was succeeded by de Quervain, vice president, who officiated in his place. Professor von Eiselsberg, who was to have presided at Cairo, was ill in Vienna, and Dr. Schoenmaker of The Hague, vice president, presided in his place. The American constituency of the society is one of the largest in the organization. Out of a maximum quota of 150 members allowed for the United States, 127 American surgeons—all distinguished by their rank and the merit of their contributions, have been admitted to fellowship on the recommendation and endorsement of the American committee, which at present consists of Dr. Elliott C. Cutler, professor of surgery at Harvard (chairman), and Drs. Eugene H. Poole of New York, and Rudolph Matas of New Orleans. The eleventh congress will be held at Vienna in September 1938 under the presidency of Dr. Rudolph Matas, emeritus professor of surgery, New Orleans, with Profs. Ferdinand Sauerbruch of Berlin and S. Hybbinette of Stockholm, vice presidents. The subjects selected for special discussion are (1) the surgical treatment of arterial hypertension, (2) bone grafts and (3) the surgical treatment of cysts and tumors of the lungs. The conducted sight-seeing tours usually provided by the society for the convenience and entertainment of those who attend the congress are being planned for the congress through Czechoslovakia, Hungary, Dalmatia and other countries of special interest to tourists.

Society News.—The International Association of Police and Fire Surgeons and Medical Directors of Police and Fire Surgeons and Medical Directors of Civil Service Commissions will hold its annual meeting at the Hotel Taft, New Haven, Conn., October 8-10.——The annual meeting of the Southwestern Medical Association will be held in El Paso, Texas, November 19-21. Guest speakers will be Drs. Harold Brunn, San Francisco; Thomas E. Carmody, Denver; Ralph A. Kinsella, St. Louis; James T. Case, Chicago; Warren T. Vaughan, Richmond, Va.; Nelse F. Ockerblad, Kansas City, Mo.; Willard R. Cooke, Galveston, Texas, and Isidore Cohn, New Orleans.——The next annual session of the American Therapeutic Society will be held in Atlantic City, June 4-5, 1937. Dr. Chevalier L. Jackson, Philadelphia, is president and Dr. Oscar B. Hunter, Washington, D. C., secretary.——The American College of Physicians has purchased a residence at Forty-Second and Pine streets, Philadelphia, to establish permanent headquarters.——The American Association of Industrial Physicians and Surgeons will meet in Atlantic City, October 7-9, at the Traymore Hotel.——The American Dietetic Association will hold its nineteenth annual meeting at the Hotel Statler, Boston, October 12-15. Speakers will include Drs. Chester M. Jones on "Protein Deficiencies"; Walter Bauer, "Diet for Arthritis"; George R. Minot, "Anemias of Nutritional Deficiencies"; Charles Macfie Campbell, "Diet of Psyche"; Wilson G. Smillie, "Place of the Nutritionist in Public Health Programs." All are of Boston. Vilhjalmur Stefansson, Ph.D., New York, will address the annual banquet on "Adventures in Diet."

FOREIGN

Malaria Congress Postponed. — The third International Congress on Malaria, scheduled to be held in Madrid October 12-18, has been postponed on account of the present situation in Spain, it is announced. It is hoped to convene the congress sometime during the spring or summer of 1937. Dr. E. Luengo, Madrid, is general secretary.

Society News.—The first European Congress of Reconstructive Surgery was to be held in Brussels, October 3-4.——The ninth International Congress of Military Medicine and Pharmacy will be held in Bucharest, Rumania, May 8-14, 1937. Subjects to be considered include organization and functioning of health service in the combined operations of armies of land and sea; transport, hospitalization and treatment of gassed persons; surgical service for motorized troops.——The Holland Gynecologic Society at Amsterdam is to organize an International Congress for Obstetrics and Gynecology in connection with its fiftieth anniversary in 1938, it is reported. The secretary of the committee organizing the congress is Dr. F. C. van Tongeren, University Clinic for Obstetrics and Gynecology, Wilhelmina-Gasthuis, Amsterdam W.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 12, 1936.

Lord Moynihan Is Dead

The death of Lord Moynihan in his seventy-first year has removed the foremost figure in British surgery. While suffering from the blow of his wife's death, which he felt severely, he had a seizure, never recovered consciousness and survived her only a week. The son of an Irish officer who served with distinction in the Crimean war and Indian mutiny, he was trained at the Leeds Medical School and graduated M.B. in the University of London in 1887. In 1893 he passed the examination for master of surgery and received the gold medal. He was appointed a teacher of anatomy at the Leeds Medical School and later assistant surgeon. His progress was rapid. In 1909 he became professor of surgery in the Leeds Medical School; in 1912 he was knighted and was elected to the council of the Royal College of Surgeons and in 1926 to the presidency, a position which he held for the unprecedented period of six years. In 1918 he was made a baronet and in 1928 he became Baron Moynihan of Leeds. In the great war he was consulting surgeon to the British expeditionary force. Academic honors were showered on him from all over the world.

Moynihan began his career as a general surgeon, but he soon devoted himself to the surgery of the stomach, gallbladder and intestine, of which he became the leading exponent in this country. The subject was in its infancy when he began to work at it in association with another great abdominal surgeon, the late Mayo-Robson. Together they wrote a book on Diseases of the Stomach, which was published in 1901, at a time when little was known of the subject from the surgical standpoint. Moynihan was not long in impressing his remarkable personality on the surgery of the abdomen and in raising the previously high reputation of the Leeds school to its zenith. Enthusiastic, energetic in testing the latest ideas of others and in producing his own, a beautiful operator and a master of trenchant exposition, his clinic and his writings attracted the whole surgical world. He was indeed, as Rutherford Morison termed him, "a live wire." He was the British counterpart of J. B. Murphy, for whom he had an intense admiration, as the first Murphy memorial lecture, delivered by him to the American College of Surgeons at Montreal in 1920, shows. He was incomparably the best speaker in the profession and one of the very few in its history who could be called an orator. He could without hesitation deliver a perfectly phrased lecture without a note, though it is said that he previously memorized his lectures. His most important work was first delivered as addresses to medical societies, which were later collected and published in book form. His command of language enabled him to crystallize his teaching in telling phrases which live.

PATHOLOGY OF THE LIVING

In an address with the title "The Pathology of the Living" he contrasted the pathology of the living with the pathology of the dead. He pointed out that the knowledge gained during an operation showed that the postmortem evidence was of small value compared with that which had been furnished during the life of the patient. It was of greater import to see the actual condition in life of an organ that was abnormal than to see it months or years afterward when unalterable and extensive advances, and perhaps terminal infection, had been added to the simpler original cause of the disturbance in health. It was of much more importance to know the pathologic conditions that caused present suffering—a change that perhaps was remediable—than to know the fullest particulars of an unhindered morbid change that at last caused death. This was a favorite thesis, to which he returned again and again.

INAUGURAL SYMPTOMS

Closely connected with the preceding subject was another address given under the title of "Inaugural Symptoms" in 1908. He pointed out that when the textbooks of medicine were written it was the late symptoms and signs which were thought to be characteristic. But late symptoms were too often the heralds of death, while inaugural symptoms might be the cry for timely surgery. There was need for the earnest investigation of inaugural symptoms. Malignant disease came too often to surgeons when the time for safe operative treatment was past. "We hesitate to diagnose cancer of the stomach before a lump can be felt. We question the evidence of duodenal ulcer until hemorrhage occurs, although it is a late, dangerous and preventable complication. We dare not hint the presence of gallstones till jaundice comes, though symptoms of the plainest meaning have been present for years. Indeed, much of the textbook symptomatology urgently demands revision."

GASTRIC AND DUODENAL ULCER

Perhaps his most important work was done in connection with the diagnosis and treatment of gastric and duodenal ulcer. He described the symptoms with great acumen and introduced the term "hunger pain" to describe a pain eased by the taking of food and appearing a few hours after the meal, which occurred both in gastric and in duodenal ulcer and was always associated with hyperchlorhydria. In gastric ulcer the pain gradually disappeared before the next meal, but in duodenal ulcer it continued until the next meal or until food was taken to relieve it. Thus the rhythm of gastric ulcer was quadruple: food, comfort, pain, comfort; of duodenal ulcer, triple: food, comfort, pain. Duodenal ulcer, which was far more common than gastric ulcer, could always be diagnosed with considerable confidence by the history.

THE DIAGNOSIS OF GALLSTONES

He pointed out that the error carried down from one generation to another—that in the majority of cases gallstones cause no symptoms—had been dispelled by the work of the surgeon. In operating in an advanced case of cholelithiasis a history of inveterate, though perhaps trivial, dyspepsia could almost always be obtained. The symptoms were fulness, weight, distention or oppression in the epigastrium coming on soon after meals, usually within half or three quarters of an hour, relieved by belching and dismissed almost on the instant by vomiting, elicited with remarkable constancy by certain articles of diet.

THE EARLY DIAGNOSIS AND TREATMENT OF CANCER

He was never tired of impressing both the public and the profession with the importance of the early diagnosis of cancer. Too many physicians were skeptical about the good results that could be obtained from surgical treatment and in too many cases allowed the patient to drift into the condition that made recurrence after operation inevitable. "Wait and see" was wrong; the advice should be "Go and look at once." His incisive power of speech is shown by the way he startled a large audience in the house of the British Medical Association, assembled to hear a popular lecture on the cancer problem: "If the law of averages holds, 100 persons in this room will die of cancer."

HIS WORK FOR THE SURGICAL PROFESSION

An ardent reformer, a man of consummate tact, impressive both to the profession and to the public, an excellent administrator, he was able to bring about more and greater changes in the

surgical profession than were ever before accomplished by one man. He filled the office of president of the Royal College of Surgeons with great distinction. Before his time the college was regarded by many as an examining body with an admirable museum, in connection with which valuable lectures were delivered. Under his lead extensive provision was made for experimental research, both at the college and at the Buxton Browne Research Farm, which was established at Downe in Kent. He was very keen on research, but he objected that physiology, in spite of its stupendous growth, had little interest in man and was becoming more and more remote from him. The immediate requirement was a better knowledge of the normal man and of the "near normal man." A new science of "paraphysiology" was required. He took the lead in the foundation of the *British Journal of Surgery* and during the whole period was chairman of the editorial committee. He saw that the surgeons of this country kept too far apart and he founded the Moynihan Surgical Club, the members of which spend a week together visiting hospitals abroad and meet for a second time in the year to visit a hospital in which one of them works. He was also prominent in founding the Association of Surgeons of Great Britain and Ireland. His last enterprise was the presidency of the Voluntary Euthanasia Legalisation Society, which was formed at the end of 1935 to make legal relief by death of painful incurable disease. He was to introduce a bill on the subject in the house of lords.

The Sterilization of Catgut

The recent occurrence of several groups of cases of tetanus, following operations in which catgut was used, has caused the Ministry of Health to issue a memorandum on this danger. The therapeutic substances regulations allow the sale of sterilized ligatures and sutures only under a license, the granting of which is conditional on the routine testing for sterility of samples from each batch of catgut manufactured or imported, while the premises, staff and methods of manufacture are controlled by periodical inspection. But in some hospitals catgut is still used which is not so controlled. It is bought raw and is "sterilized" in the hospital by a process which may or may not be satisfactory. In nine cases (of which five proved fatal) which recently came under the notice of the ministry, the evidence pointed to such "home cured" catgut as the source of infection.

In a report rendered to the Scottish board of health in 1928 Mackie analyzed the evidence in eleven cases of postoperative tetanus that occurred between 1920 and 1928 in a single hospital which was supplied with catgut from one source and concluded that the evidence pointed definitely to catgut as the source of infection. The danger of insufficiently sterilized catgut is therefore evident.

The sterilization of catgut is an elaborate and difficult process. As many as fifty-one methods have been used and many of them have been found not to be reliable. Destruction of the spores of the tetanus bacillus is the great difficulty. Mackie found that, if the unspun ribbons were soaked in hydrogen peroxide for twelve hours and the spun strings treated with iodine water for eight days, the excess of iodine being then removed by washing in alcohol, a sterile gut with good physical properties was produced. The conclusions of the Ministry of Health are as follows: 1. Serious dangers attend the use of raw catgut, or so-called internally sterilized catgut, to which sterilizing processes of doubtful efficiency are applied in the hospital. 2. Many brands of efficiently sterilized catgut controlled under the therapeutic substances act are available. 3. Postoperative tetanus, gas gangrene and other infections from surgical catgut can be prevented by the use of catgut manufactured by licensees under the act.

PARIS

(From Our Regular Correspondent)

Aug. 22, 1936.

Organized Medicine and the Forced Retirement Bill

In a recent letter, reference was made to a bill termed the Pomaret bill, which proposes to relieve the congested condition in the liberal professions. If the bill is passed, which at present seems unlikely, all lawyers, architects, physicians and druggists will be obliged to surrender their diplomas at the age of 65 and be forced to retire from active practice without any remuneration in the form of a government pension.

The interests of the medical and dental professions in France in such matters is looked after by "syndicats," or associations, which unfortunately do not include as members as large a proportion of the physicians and dentists as do the corresponding associations in the United States. Nevertheless the influence of these "syndicats" is considerable here, and they are making a strong fight against passage of the Pomaret bill, and the chances at present are that the proposed forcible retirement clause of the law will never reach a stage beyond that of discussion. The Conféderation des syndicats médicaux français, which includes all the local protective associations, in its August bulletin states that the idea of permitting every physician to retire at the age of 65, if he so desired, has been provided for by this association in collecting money for a mutual insurance fund, so that an annuity could be paid, enabling a physician at the age of 65 to add such a sum to any funds already set aside by him and thus permit him to live comfortably. But this retirement should remain an entirely voluntary affair. When the government delivered a license to practice in the past, no time limit as to its use was set, and hence the contract cannot be broken by one of the parties alone. The confederation is of the opinion that a voluntary retirement is not to be objected to but that retirement should not be compulsory unless an adequate annuity is given by the state to every physician who is obliged to cease practice at 65, and that half of the annuity should be given to the physician's widow in case of decease.

At the July 19 meeting of the executive committee of the Conféderation des syndicats médicaux français, the following resolutions were passed as an expression of the opinion of the confederation on "bill 151 (Pomaret) tending to assure immediate and steady employment of French youth":

1. No such law, affecting unrestricted practice of medicine, should have been deposed as a bill before the legislature without consulting organized medicine.

2. The federation will oppose with all the resources at its disposal the limitation of the license to practice beyond the age of 65 years. A voluntary retirement cannot be objected to, provided a fund is established by the government so that an adequate annual pension can be given those who wish to retire at the age of 65. Such a fund is to represent the total of annual obligatory premiums paid by all practicing physicians, collected by the government and set aside as a mutual insurance fund for the voluntary retirement of physicians.

3. The naturalization of foreign-born physicians and medical students must be immediately prohibited. The illegal practice of medicine and quackery, as well as the unethical exploitation of pharmaceutical preparations, should be more strictly controlled than at present.

This third resolution aims to correct an abuse of the laws passed in 1935 which did not permit foreigners to be granted licenses to practice. In spite of this apparently strict regulation, many foreign-born applicants for state licenses have overcome the objections by becoming naturalized, and thus the overcrowding of the profession has been but little relieved.

The uncontrolled exploitation of all forms of quackery and drugs here justly merits the demand of the federation for stricter supervision.

Treatment of Acute (Staphylococcic) Osteomyelitis

The treatment of acute (staphylococcic) osteomyelitis is still being discused at the Académie de chirurgie, the leading surgical society of Paris. In the letter published in THE JOURNAL, June 13, papers read by Leveuf and Mathieu were referred to in which a plea was made, based on a relatively extensive experience, not to operate in cases of acute osteomyelitis due to staphylococci until the acute local and general symptoms had subsided.

At the May 27 meeting the discussion was continued by Sorrel, who has charge of a large children's surgical service in Paris and thus has ample opportunity to see such cases. He stated that the portal of entry is most frequently some skin lesion which fails to attract attention at the time when the involvement of the bone medulla manifests itself. Although the bacteria are carried by way of the blood vessels, blood cultures are negative until the acute bone symptoms appear at the same time as the general evidences of a septicemia, at which period the blood cultures become positive. An article by Bariety on staphylococcic septicemias published in the *Semaine des hôpitaux* in February was cited by Sorrel, showing that the body possesses defense mechanisms which act on the bacteria circulating in the blood, by lysis, fixation or elimination. In order that a septicemia should persist, a constant supply, i. e., multiplication of bacteria, must take place. In an acute osteomyelitis, it is the bone focus which furnishes such a constant supply. There are cases of acute osteomyelitis in which the symptoms of a general septicemia dominate the clinical picture. Such patients are more often observed by internists than by surgeons. Between these two, predominantly local and predominantly generalized cases, many intermediate cases are seen by both internists and surgeons, and it is in these that the question arises as to what form of treatment should be adopted.

Another point of interest is one conceded by bacteriologists; viz., that the staphylococcus is a poor antigen and hence that vaccination against this type of infection is difficult or impossible. This explains the slow healing of osteomyelitic foci and the frequency of exacerbations after apparent recovery.

These two facts permit one to say, first, that well localized osteomyelitic foci can be the starting point of septicemia and of secondary foci and, secondly, that the spontaneous defense mechanism of the body is powerless because it can produce but few and often no antibodies. As Mathieu stated at a previous meeting, the forms under which an acute osteomyelitis can present itself clinically vary so greatly that the same treatment for all cases is impossible. As to general treatment, much was expected of vaccinations but the results have not been very encouraging. The same has been true of the bacteriophage and immunotransfusion treatment. The future alone will reveal whether the use of the Ramon staphylococcus anatoxin will be of any value.

The surgical treatment ought not to be the same for all cases. One should be guided by the local lesions and the evolution of the infection in general.

Sorrel believes that the only cases of acute osteomyelitis in which a late operation should be performed are those in which a staphylococcic septicemia exists but the bone involvement is for a long time of secondary importance. These patients should be operated on only when the general symptoms have subsided. Such cases are relatively rare. Sixty-two cases of acute osteomyelitis have been treated by Sorrel since 1931, and fifty-nine of these were due to staphylococci. Eleven of the fifty-nine patients died, and recovery was more or less complete in forty-eight. In twenty-eight cases the general infection was a severe one with extensive bone involvement. Twenty-six of these patients were operated on by resection and two by trephining, with two deaths in patients having multiple foci. In six cases the bone lesion was of secondary importance as compared to the general infection. Five of these six patients died.

Until the staphylococcus anatoxin and antistaphylococcus serum proves to give good results, Sorrel believes that early operations, such as simple incision of a subperiosteal abscess, trephining or diaphyseal resection, are indicated. Only in the severe septicemic form is a delayed operation justifiable.

The discussion was continued by Boppe, who stated that, if a trephining operation is not followed by subsidence of local and general evidences of infection, a resection of the entire shaft should be performed. Boppe was in favor of delayed operation. A large number of patients, operated on late or not at all, had recovered following immobilization supplemented by general treatment. There are cases, however, in which one has the impression that the expectant method has been harmful. The prognosis of a given case of acute osteomyelitis presents many unknown elements. With the exception of blood cultures, an element of definite gravity but not at all of fatal prognostic significance, there are no sure tests which permit one to judge the evolution of an osteomyelitis.

BERLIN

(From Our Regular Correspondent)

Aug. 4, 1936.

Convention of German Phthisiologists

At the recent annual convention of phthisiologists the question of legal measures in furtherance of the antituberculosis campaign was discussed. The groundwork for a greater centralization of antituberculosis activities was laid when the centers for the care of the tuberculous throughout Germany were placed under the supervision of officers of the public health service and the latter organization thus assumed the care of tuberculous patients as a part of its legitimate duties (THE JOURNAL, Sept. 22, 1934, p. 932; June 1, 1935, p. 2011). Four papers on the question of legal regulation were submitted to the congress and are herewith summarized: The protection of children and young people against infection with tuberculosis by persons not belonging to the family is of the utmost importance. It was demanded that in social institutions, based on legal compulsion, such as the schools, yearly physical examinations of both teacher and pupil be made obligatory. Any person found to be infected should be segregated from his fellows. A recent decision of the reichsgericht (the highest German tribunal) expressly fixes responsibility of the appointed officials. Before admission to certain semivoluntary groups (youth organizations, apprenticeships and so on) the candidate must be certified as free from tuberculosis. In voluntary relationships such as domestic service and the kindergarten, employers and parents should demand certificates of health for employees or children from the antituberculosis centers. Further legislation to supplement that already in force should provide for amplification of the present law on compulsory reporting of tuberculosis cases, compulsory medical examination at the tuberculosis stations, prophylactic measures (compulsory isolation if necessary), sanitary supervision of certain occupational groups, and more drastic measures of disinfection. In order to protect the community against occupational tuberculosis, the exercise of certain callings should be forbidden a person who presents an active, infectious tuberculosis, the person so excluded to be indemnified, of course, against economic distress. Furthermore, compulsory examination of both healthy and sick persons should be stipulated, such examination to include roentgenography of the thorax. Since the entire popu-

lation cannot be examined simultaneously, local sanitary officials should be empowered to select the persons to be examined at a given time. Compulsory treatment is both necessary and practicable. It might consist of detention in an institution or of surgical intervention; thoracoplasty, for example. If the patient withholds consent to an operative intervention that promises to be successful, compulsory curative measures should be carried out until the patient is no longer able to spread the infection to others, the costs of such treatment to be divided between the patient himself and the public health service. Repeated reference was made to the successful experimentation with compulsory isolation of asocial tuberculous patients which has already been attempted in Thuringia (THE JOURNAL, Oct. 19, 1935, p. 1284). The discussion that followed the reading of these papers showed that the phthisiologists as a whole approved of the new measures suggested. Both the papers and the discussion are of especial importance, since they provide a substantial foundation for new antituberculosis legislation.

Klare of Scheidegg submitted a report on active pulmonary tuberculosis in children and young persons. The follow-up control of 502 actively tuberculous children and youths who received treatment at Klare's institution during the years 1916-1933 yielded a gloomy prognostic picture. (Control was effected by means of triennial follow-up questionnaires.) The chances for recovery of patients under the age of 7 who present far advanced forms of the disease are poor; for this group a mortality of 95.5 per cent was determined at the end of ten years. For patients under the age of 13, the corresponding death rate is lower by 15 per cent; but 80 per cent is still a shockingly high figure. Klare hopes to be able to reduce the mortality to 75 per cent or perhaps even to 65 per cent; lower values can scarcely be obtained, as puberal influences seem to impair all the organism's forces of defense against phthisis. Lymphatism is always to be regarded as a favorable indication in tuberculous children and adolescents. Early detection of the disease may favor recovery by making possible the institution of an active therapy (collapse treatment). Cavernous decomposed early infiltrates above all can almost without exception be brought to a healing by means of a timely initiation of collapse therapy.

Böhne of Hamburg stated (on the basis of 20,000 cases examined) that the Meinicke tuberculosis reaction is markedly specific. By it active pulmonary tuberculosis as well as widespread bone and genital tuberculosis can be determined. The test fails, however, to establish quite recent infiltration. The activity and extent of the process run principally parallel to the intensity of the reaction manifested. Inactive cases exhibit negative reactions. The Meinicke reaction is above all of practical value for the detection of pathologic processes that are not clinically and roentgenologically demonstrable.

With regard to measures of disinfection, E. Gabe stated that the danger of infection from dust irritation has been grossly exaggerated. Guinea-pigs, for example, will remain healthy even after a twenty-four hour stay in the dusty atmosphere of a room in which blankets and clothing of tuberculous persons have been beaten out. Dust specimens from the floor of the solariums for the tuberculous, from other rooms and from washing water after the cleaning of the wall paper were all found to be free from tubercle bacilli. In institutional hygiene, the discipline is the most important factor and chemical disinfectants are to a great extent considered unnecessary. For blankets formaldehyde disinfection and for linen boiling are the methods of choice. The complete destruction of the excreta is of the utmost importance, since danger of infection through the drainage is thus obviated.

Finally the question of the significance of thoracoplasty was discussed. Graf of Coswig stated that investigations carried on during the past fifteen years have consistently led one to form the opinion that disintegrating tuberculous cavities in the lungs, or at least those which develop to medium size and endure for a number of months, excepting in rare instances, do not come again to a healing without operative intervention. Such cavities are a constant menace to the patient's life and, besides, their presence means a serious risk of acquiring the infection for persons in proximity to the sufferer. Thoracoplasty should be resorted to in proper cases if pneumothorax and its supplementary measures prove insufficient. Thousands of patients who otherwise would have been lost have this operation to thank for their recovery. During the past ten years various types of this intervention have been worked out that not only bring about an authentic healing of the cavernous areas, which are situated for the most part in the upper portion of the lungs, but also make it possible to preserve the still healthy pulmonary tissue on the affected side.

VIENNA

(From Our Regular Correspondent)

Aug. 14, 1936.

The Ninth International Dental Congress

The largest of all dental organizations, the Fédération dentaire internationale, is accustomed to hold a quinquennial scientific convention. The ninth congress of the federation was held early in August at Vienna. For the last two and one-half years a local committee of sixteen, of which Professor Dr. Pichler was chairman, had been preparing for this gathering. In working out a program it was decided that each forenoon was to be devoted to the reading of papers on the more recent investigations of the last five years and the afternoons were to be given over to demonstrations, carried out before small groups, of various special therapeutic methods and examination procedures. To reduce to a minimum the linguistic difficulties of an international convention, for the first time at one of these congresses a method was used that has been proved serviceable in the deliberations of the League of Nations. The speaker had a microphone before him and his speech was listened to by interpreters, wearing earphones, who were housed in closed booths. As the words of the speaker were received by the interpreters the latter would immediately translate orally into a microphone, and an amplifying system would then convey the translated speech to the audience seated in the hall. The speeches were broadcast in German, French and English and the listening delegate could select whichever language he wished by means of an apparatus attached to his chair. Thanks to a corps of first class interpreters, the translations were made so rapidly that a listener could well believe that the speaker was talking in any of the three tongues. In addition, each delegate was presented prior to the transactions with a two volume 1,600 page edition of all the original discussions to be read. This meant that only the remarks of the open discussions would be new to the audience. Altogether some 4,000 dentists from forty-five different countries participated in the proceedings. Prof. G. Villain of Paris occupied the chair. After the addresses of welcome by the governmental and academic dignitaries the presentation of the international Miller prize for the most important work of the last five years took place; Profs. Maurice Roye of Paris, Bernhard Gottlieb of Vienna and A. Cieszynski of Lwow each received the gold medal.

Proceedings were held simultaneously in three large assembly halls and reflected throughout the tremendous interest of the participants. In section 1 Professor Grumbach of Zurich, as principal speaker, read a paper on focal infection. Our increased knowledge of oral sepsis has brought with it new and perplexing problems and it has brought to light the relation of the teeth to various diseases. In many disease condi-

tions formerly loosely ascribed to "cryptogenic sepsis," focal infections are now inculpated. Under "focal infection" are classified those disease conditions characterized by the presence of a chronic hidden focus of infection from which at greater or lesser intervals bacteria and their toxins enter the blood and give rise to various pathologic manifestations. About the teeth such foci are particularly apt to take the form of the so-called apical granulomas, from which bacteria in many instances are carried to the blood. Such granulomas may thus be the cause of rheumatism, nephritis, defects of the cardiac valves, septic processes, febrile conditions and a whole catalogue of other diseases. This theory, which originated in America, is not as vigorously defended as it was ten years ago.

Professor Palazzi of Milan discussed the trend in the last five years toward more detailed histologic and anatomic dental examinations. Professor Shour of Chicago spoke on the interrelation of the endocrine glands and the teeth; he stressed the fact that these glands exert an important influence on the normal formation of the teeth. Bisection or cauterization of the sympathetic nerves in the region of the gonads (Doppler's operation) has an incontestably favorable effect on various diseases of the gums (pyorrhea alveolaris). In addition, the relation of the parathyroid glands to calcium oxide metabolism, first discovered by the Viennese anatomist Erdheim, is of especial importance.

In section 2, discussions of the substitution of artificial teeth were furnished by Dr. Stansbery of Seattle and Professors Fish of London, Villain of Paris and Wustrow of Greifswald. The last named exhibited models to prove that in mastication with a plate prosthesis a force of some 15 Kg. can be placed in action without any damage to the mucous membrane lying beneath the prosthesis. In section 3 the history of dentistry was the principal topic. A paper by Professor Salamon of Budapest on the dental bridge was of interest. Dental bridges were introduced into Europe from America by Thomas Evans in 1860. Evans also made known the first set of india rubber teeth in Europe. Substitution of artificial teeth was known to remote antiquity; in ancient Egypt, Etruria and Phenicia there were dentists capable of fashioning excellent dental bridges. The art subsequently became lost and was revived in the first third of the eighteenth century. The historical development of the treatment of the roots and the use of anesthesia in dentistry is likewise extremely interesting. In the year 1870 the dental engine, then driven by foot power, was first introduced; several years later came the engine driven by electricity.

The causes and treatment of dental caries was the principal topic on the second day. Professor Bunting of America reported on the investigations undertaken by the so-called Michigan Research Group, which is composed of dentists, bacteriologists and biochemists. It has been ascertained from these investigations that the causative agent of dental caries is an organism of the Bacillus acidophilus type. This organism is always present in carious dental substance and can be detected in the saliva of patients with dental caries. It is not to be found, on the contrary, in persons immune to the disease. The Michigan investigators undertook nutritional tests in the form of group examinations of the different dietetic regimens in use among school children and institutions. Indications were that the ingestion of foods containing calcium oxide, phosphorus, vitamin D or alkaline nutriment is virtually without influence on dental caries.

On the other hand, the old finding was confirmed that a regimen rich in sugar fosters the propagation of Bacillus acidophilus and therewith caries. Conversely, studies of the saliva showed that the development of this bacillus is impaired by a diet deficient in sugar. The type of nutriment was regarded by this group of investigators not as in relation to the chemistry of the bodily fluids but as exerting a direct influence within the oral cavity proper, in the immediate surroundings of the teeth. The possibility of producing a protective substance against caries had been demonstrated, and inoculation experiments had already been attempted. If Bacillus acidophilus was present in the oral cavity, inoculation might even produce dermal reactions. The protective substance against caries seemed to be present in the blood, so one should consider the possibility of a systematic inoculation therapy in caries.

A paper by Professor Euler of Breslau on dental defects conditioned by the nutriment dovetailed admirably with that of the Michigan men. In teeth, discovered in excavation, that probably are about 4,000 years old, Euler was able to establish dental caries in only 1.5 per cent of the skeletal remains, a contrast to the frightfully high present-day incidence. The speaker called attention to the decalcifying action of lactic acid and described how the carious process is furthered by the lodging of food remnants (especially particles of sweet foods) between the teeth. Honey forms an exception; it causes no fermentation in the mouth and since it contains formic acid and formaldehyde (although in small amounts, to be sure) it acts as a mild antiseptic. Professors Weavre of London and Paffenberger of Washington and Drs. Bauer of Innsbruck, Joachim of Brussels and Smreker of Vienna provided discussions of the various problems presented by caries and other dental material. Dr. Weinmann was able to prove the existence in the saliva of a protective substance against caries. The salivary corpuscles contain a ferment-facilitating decomposition of protein that is found in smaller quantities in carious subjects and in larger quantities in the noncarious. Weinmann was able further to show that persons inclined to have carious teeth secreted much less saliva than persons with healthier mouths. The bactericidal power of the saliva is also connected with the salivary corpuscles. The latter, somewhat like the leukocytes, form a sort of police force.

One section of the congress concerned itself with discussions of dental education. Thorough descriptions of the organization of instruction in dentistry in their respective countries were provided by speakers from Poland, Japan, France, Hungary and Austria. In Austria the title "zahnarzt" (dental physician) is protected by the most rigid legal restrictions. In that country every dentist must first be a regular doctor of medicine and then spend four additional semesters in dental studies, after which he must pass a rigorous examination in the field. The Austrian system of regulation has come to serve as a model for the other countries of Europe. Interesting too was a paper by Dr. Mansbach of Palestine on the dental hygienic examination of a large number of children between the ages of 3 and 12. Children from rural communities where the diet is chiefly vegetarian presented an almost complete immunity from caries, whereas among children from Jerusalem and other urban areas there was a substantial incidence of dental caries.

The problem of anesthesia took one entire morning session of the congress. Two opposing schools engaged in debate: the adherents of narcosis and the adherents of injection anesthesia. Professor Sicher of Vienna states as a fact that, in every country where the study of maxillary anatomy has attained a high level, injection anesthesia rather than the more mechanical procedure of narcotic anesthesia is the method of preference.

Professor Parma of Prague, speaking on the problem of roentgenology, declared that no enterprising dentist could reckon without it. Some roentgenograms of teeth were exhibited. Interest attached to the problems of treating and filling the roots. In recent years the formerly overdone practice of extracting diseased teeth has fortunately been sharply checked and dentists generally have come to favor the killing and filling of the diseased roots. The pulp, the living dental marrow, is indeed the most precious part of any tooth and should be pre-

served as long as possible. In England, in Switzerland and in Austria, special prominence is accorded this problem. Gottlieb of Vienna in particular has devised a unique method: he does not subject the living pulp to treatment with medications but removes it under anesthesia by a purely surgical procedure. By this means the connective tissue is stimulated to a new formation of adamantine. There has as yet, however, been no agreement as to the method to be employed in the treatment of gangrenous pulp.

One section concerned itself exclusively with the question of dental hygiene in the school. In Vienna as early as 1911 this problem was partially solved but not till 1922 was a systematic effort made to cope with it. Drs. Driak and Greiner, both of Vienna, submitted discussions. Austria at present boasts forty school dental clinics, eighteen of which are located in Vienna. Whereas in the year 1922 less than 4,000 children were at any one time under the supervision of the school dental hygiene service, in the year 1934-1935 91 per cent of Austrian school children (namely 127,000) were under observation of these school clinics. Of the latter number more than 60 per cent were recorded as in need of treatment and 86 per cent of these were subsequently discharged with healthy sets of teeth.

Similar reports came in from other countries: in Oslo, Norway, for example, of 25,000 children examined, only 160 were free from dental caries. Dr. Witthaus of the Netherlands traced defective maxillary development to the use of stupidly devised sucking bags and to the habit of thumb and finger sucking in infancy. Premature loss of the temporary teeth inhibits proper mastication, and this gives rise to impaired maxillary development. Witthaus believes that caries of the permanent teeth is dependent on and conditioned by caries in the temporary teeth. He discountenances the unrestricted nibbling of sweets and advocates the eating of raw fruits at the conclusion of a meal as a means of cleansing the teeth.

Dr. Kantorowicz, who now resides in Istanbul, was the organizer of a systematic program of dental hygiene in the schools of Germany, his former home. By ordinary hygienic procedures he was able to maintain healthy dentition in 90 per cent of the German school children. Kantorowicz also postulated the extension of dental hygiene to the temporary teeth, the instruction of children in careful dental hygiene, early correction of defective dentition, and prophylaxis for diseases of the dental bed. These fundamentals should be carried on with the child of school age and later extended to the entire population, effecting as it were a systematic national dental hygiene. Kantorowicz cited Palestine as the example of a country where the campaign against a neglect of oral hygiene has gone forward with success.

The discussions of pyorrhea alveolaris marked the culmination of the congress. This disease leads to an atrophy of the gums and not infrequently to an involvement of otherwise healthy teeth, which in turn brings about an irremediable loosening process. Pyorrhea claims no fewer victims than caries. The interest of the entire medical world in this formidable problem of public health is therefore readily understandable. Prof. Maurice Roye of Paris (winner of the Miller prize) attacked the question of pyorrhea with a substantial discussion of the influence of defective heredity. He suggested that defective arrangement of the teeth and disturbances of the "bite" facilitate the loosening process. Professor Entin of Leningrad discussed the pathologic anatomy of the condition; atrophy of the gums and the formation of pus pockets may be taken as characteristic. The last named manifestation is not yet well understood; it is believed that disturbances of the metabolism and of the glands of internal secretion are etiologic factors in the disease. Of persons suffering from pyorrhea alveolaris, 67 per cent are between 30 and 40 years of age; there is a higher incidence among women of this age group. Dr. Entin is of the opinion that the gastro-intestinal system figures in the etiology of the disease. He believes that observation of the nervous system will yield important indications. Disorders of the intestine, kidneys and liver also all too frequently coincide with dental disturbances.

Professor Häupel of Prague discussed his own philosophy of the etiologic factors in pyorrhea alveolaris. It is his belief that any general illness which is influenced by cellular metabolism is capable of producing pyorrhea. The disease has an extremely high morbidity in many countries. According to Häupel, it is more frequent among slender types than among the stout. It may appear as a sequel to infectious disease, notably influenza. Dr. Weinmann of Vienna interposed that he had observed a hypofunction of the anterior lobe of the hypophysis in pyorrhea alveolaris patients. Professor Häupel for his part had often observed that Doppler's operation leads with virtual experimental certainty to an amelioration of the purulent and loosening processes. Doubtless too, important rôles are played by local factors such as tartar or the irritation set up by ill fitting artificial teeth. Häupel recommends as therapeutic measures the application of oxygen and of escharotics, and the opening and eradication of the pus pockets. The goal is the restoration of healthy gums and to accomplish this an adequate dental hygiene is also necessary.

Dr. Orman of the Viennese school is of the opinion that two forms of pyorrhea alveolaris may be differentiated, the one due solely to neglect of oral hygiene, the other dependent on disturbances of the general metabolism. To be sure, the medical procedure is identical for the two forms. The first consideration is always a painstaking removal of the tartar and the pus pockets. Any course of treatment will be rendered useless if the patient is not made conversant with the correct technic of the tooth brush, a knowledge that should be inculcated in childhood. Any defects of dentition should be corrected as quickly as possible. At best the treatment of pyorrhea alveolaris will require an unusual amount of time and patience.

A round of social functions together with the usual excursions and receptions brought to a close the proceedings of the ninth congress.

Marriages

NORMAN R. SLOAN to Mrs. Catherine Flynn Ward, both of Christiansted, St. Croix, Virgin Islands, August 27.

WILLIAM FREDERICK I. DEY, Saratoga Springs, N. Y., to Miss Margaret Rawlings of Poughkeepsie, June 12.

JOSEPH F. BENJAMIN, Ridgewood, N. J., to Miss Agnes Sweeney of Glen Rock, August 1.

ERNEST HENRY KEUTMANN to Miss Harriet Kenyon Todd, both of Rochester, N. Y., June 18.

JAMES BORDLEY III, Baltimore, to Miss Julia Peabody Ross of Chestnut Hill, Pa., July 4.

MARTIN F. ZIEMER, Chicago, to Miss Louise Anne Simon of Elkhart, Ind., September 20.

SAMUEL MACON CARRINGTON to Miss Nellie Upchurch, both of Oxford, N. C., July 17.

VERNON A. WEED to Miss Marjorie Kundert, both of Red Lake Falls, Minn., June 21.

GEORGE L. KRESS, Warsaw, Ind., to Miss Aline Welsheimer of Columbia City, June 14.

ROBERT A. BROWN JR. to Miss Virginia Harris, both of Greenville, S. C., May 22.

WALTER S. BOOTH, Elizabeth, N. J., to Miss Matilda Mary Nogi of Linden, June 27.

KINLOCH NELSON to Miss Alice MacGill Deford, both of Richmond, Va., July 23.

ARNOLD I. WEBMAN, Fremont, Neb., to Miss Lucille Polishuk of Chicago, June 21.

Deaths

Frankwood Earl Williams ✠ New York; medical director of the National Committee for Mental Hygiene from 1922 to 1931; died, September 24, of acute intestinal obstruction while aboard the White Star liner *Georgic*, aged 53. Dr. Williams was born in Cardington, Ohio, May 18, 1883. He attended high school in Indianapolis and received the bachelor of arts degree from the University of Wisconsin in 1907 and the medical degree from the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1912. He was first assistant physician at the Boston Psychopathic Hospital from 1913 to 1915; medical director of the Massachusetts Society for Mental Hygiene from 1915 to 1917; chairman of the Massachusetts Advisory Prison Board from 1916 to 1917; associate medical director of the National Committee for Mental Hygiene from 1917 to 1922, and then medical director until 1931. During the World War he served as first assistant and chief of the division of neurology and psychiatry in the office of the Surgeon General of the army and was a lieutenant colonel in the Officers Reserve Corps from 1919 to 1929. He was a member of the American Psychoanalytic Association, the American Psychiatric Association, the New England Society of Psychiatry, the American Psychopathological Association and the American Orthopsychiatric Association. Dr. Williams was chairman of the mental hygiene section of the National Conference on Social Work from 1917 to 1919 and from 1922 to 1924; vice chairman of the National Health Council from 1922 to 1923; member of the administrative board of the Institute of Child Guidance of the Commonwealth Fund from 1927 to 1931; member of the advisory council of the New York Health and Tuberculosis Demonstrations and also the Milbank Memorial Fund until 1931, and member of the board of directors of the New York Psychoanalytic Institute. He was also a member of the teaching staff of the Smith College for Social Work, Northampton, Mass., from 1921 to 1926 and the New York School of Social Work in 1924. From 1926 to 1929 he was a lecturer on psychiatry at the Yale University School of Medicine and from 1930 to 1932 at the Columbia University College of Physicians and Surgeons. In 1927 he received the honorary degree of doctor of science from Colgate University, Hamilton, N. Y. He contributed many books and periodical articles on mental hygiene to the literature of recent years and was the editor of *Mental Hygiene* from 1917 to 1932.

John Leo Burkart ✠ Big Rapids, Mich.; Victoria University Medical Department, Coburg, Ont., Canada, 1874; Faculty of Medicine of Trinity College, Toronto, Ont., Canada, 1877; also a pharmacist; at one time state health commissioner; past president and secretary of the Mecosta County Medical Society; for many years professor of pharmacology and therapeutics at the Grand Rapids Medical College; postmaster, and for many years health officer; veteran of the Spanish-American War; aged 83; member of the staff of the Mercy Hospital; member of the staff and secretary of the Community Hospital, where he died, July 12, of coronary sclerosis.

George Frank Holland ✠ Bloomington, Ind.; University and Bellevue Hospital Medical College, New York, 1903; past president of the Monroe County Medical Society; fellow of the American College of Surgeons; veteran of the Spanish-American and World wars; district surgeon to the Illinois Central Railroad and local surgeon to the Monon Railroad; surgeon to the Bloomington Hospital; aged 64; died, July 15, in the Methodist Episcopal Hospital, Indianapolis, of carcinoma of the prostate.

Lucien P. McCalla, Bellingham, Wash.; Missouri Medical College, St. Louis, 1888; member of the Washington State Medical Association; past president of the Whatcom County Medical Society; formerly a practitioner in Boise, Idaho; for many years a member of the state board of medical examiners of Idaho; at various times on the staffs of St. Luke's General Hospital and St. Joseph's Hospital; aged 70; died suddenly, July 17, at Georgetown, Texas.

Dennis Ralph McElhinney ✠ Elizabeth, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; past president of the Union County Medical Society; fellow of the American College of Surgeons; president of the medical staff and attending surgeon on the visiting staff of the Alexian Brothers' Hospital; secretary of the staff and attending surgeon on the visiting staff of St. Elizabeth Hospital; aged 56; hanged himself, July 30.

Martin Isaac Marshak ✠ Bayonne, N. J.; University and Bellevue Hospital Medical College, New York, 1911; served during the World War; formerly city physician; on the staff of the Bayonne Hospital; attending physician to the Hudson County Parental Home; at one time superintendent of the Sanatorium of the Jewish Consumptives' Relief Society, Spivak, Colo.; aged 50; died, July 15, of heart disease and renal colic.

Frank McDonald Denslow ✠ Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, 1906; member of the American Urological Association; fellow of the American College of Surgeons; served during the World War; consultant in urology, Kansas City General and St. Margaret's hospitals; aged 59; died, July 25, in St. Luke's Hospital of carcinoma of the stomach with metastasis to the liver.

George Alfred Holliday ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1897; formerly treasurer of the Allegheny County Medical Society; member of the American Urological Association; on the staffs of the Pittsburgh City Home and Hospitals, Mayview, and St. John's Hospital; aged 64; died, July 9, of carcinoma of the liver.

Horace Palmer Beck, Newport, R. I.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the Rhode Island Medical Society and the New England Otological and Laryngological Society; formerly member of the city council; on the staff of the Newport Hospital; aged 62; died, July 5, of heart disease.

James Albert Miller, Grampian, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; member of the Medical Society of the State of Pennsylvania; past president of the Clearfield County Medical Society; for many years a member of the local school board; aged 75; died, July 11, of lobar pneumonia and pyelocystitis.

William Belvidere Meares Jr., Lexington, N. C.; University of Virginia Department of Medicine, Charlottesville, 1915; member of the Medical Society of the State of North Carolina; aged 47; died, July 13, in the Johnston-Willis Hospital, Richmond, Va., of pneumonia, following an operation for a tumor of the stomach.

Philip Abernethy Graves ✠ Oak Park, Ill.; Dearborn Medical College, Chicago, 1904; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; for many years a member of the staff of the Chicago Eye, Ear, Nose and Throat Hospital; aged 63; died, July 17.

William Jones Muzzy ✠ El Reno, Okla.; Missouri Medical College, St. Louis, 1897; past president and secretary of the Canadian County Medical Society; fellow of the American Society of Clinical Pathologists; on the staff of the El Reno Sanitarium; aged 69; died, July 12, of carcinoma of the liver.

James Wheeler Miller, Hillsboro, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1886; Bellevue Hospital Medical College, New York, 1891; member of the State Medical Association of Texas; past president of the Hill County Medical Society; aged 76; died, July 12.

Frank Manson Brown, Centreville, N. B., Canada; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; L.R.C.P., London, L.R.C.P., Edinburgh, L.R.F.P.S., Glasgow, 1887; aged 72; died, June 21, at the L. P. Fisher Memorial Hospital, Woodstock.

Samuel Fisler Ashcraft ✠ Mullica Hill, N. J.; Jefferson Medical College of Philadelphia, 1888; past president of the Gloucester County Medical Society; aged 70; died, July 4, in the Jefferson Hospital, Philadelphia, of arteriosclerotic heart disease and prostatic hypertrophy.

Frank John Fara ✠ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; member of the staff of the Hospital of St. Anthony de Padua; aged 55; died suddenly, July 22, in Berwyn, Ill., of coronary thrombosis.

George Cohn, Piggott, Ark.; National Medical University, Chicago, 1909; College of Medicine and Surgery, Chicago, 1910; member of the Arkansas Medical Society; aged 59; died, July 28, in a hospital at Paragould, of injuries received in an ambulance accident.

Oscar Stuart McMullen ✠ Victoria, Texas; University of Tennessee Medical Department, Nashville, 1904; past president of the Victoria-Calhoun County Medical Society; served during the World War; on the staff of the Victoria Hospital; aged 54; died, July 6.

Francis James Buss ✠ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the staffs of the Robert Burns, Belmont and Ravenswood hospitals; aged 60; died, July 11, of embolism.

Marguerite Agnes Muller, Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1931; member of the South Carolina Medical Association; aged 31; died, July 5, in the Myers Clinic Hospital, Philippi, W. Va., of pneumonia.

Ulysses Schuyler Colfax Busch, Cadillac, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; at one time member of the school board of Jennings; aged 61; died suddenly, July 13, of cerebral hemorrhage.

Ellsworth Paro Mills, Detroit; Detroit College of Medicine, 1899; served during the World War; aged 60; on the staff of the Highland Park (Mich.) General Hospital, where he died, July 8, of intestinal obstruction due to adhesions.

Eugene Justin McCarthy, Malden, Mass.; Tufts College Medical School, Boston, 1905; member of the Massachusetts Medical Society; member of the Veterans Administration, Boston; aged 52; died, July 28, in a hospital at Chelsea.

Walter Wingart Mannhardt ✠ Custar, Ohio; Toledo (Ohio) Medical College, 1903; served during the World War; member of the staff of the East Side Hospital, Toledo; aged 54; was killed, July 18, in an automobile accident.

Edward A. Scott, Galena, Md.; University of Maryland School of Medicine, Baltimore, 1886; for many years chief judge of the Orphans' Court of Kent County; aged 77; died, June 2, of carcinoma of the prostate and bladder.

George G. Corbet, St. John, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1898; fellow of the American College of Surgeons; orthopedic surgeon to St. John County Hospital; aged 66; died, June 8.

Ignazio Cangialosi, Hoboken, N. J.; Regia Università di Bologna degli studi Facoltà di Medicina e Chirurgia, Italy, 1908; Eclectic Medical College of the City of New York, 1910; aged 53; died, July 7, of coronary thrombosis.

Thomas James Dougherty ✠ Somersworth, N. H.; Baltimore Medical College, 1894; formerly mayor of Somersworth, city and county physician, and secretary of the board of education; aged 67; died, July 4, of angina pectoris.

Joseph D. McKelvey, East Moline, Ill.; Rush Medical College, Chicago, 1895; member of the Illinois State Medical Society; aged 65; on the staff of the East Moline State Hospital, where he died, July 29, of heart disease.

Raymond E. Chase ✠ Glendale, Calif.; University of Southern California College of Medicine, Los Angeles, 1901; on the courtesy staff of the Glendale Sanitarium and Hospital; aged 57; died, July 13, of coronary thrombosis.

Davis Breco, Ada, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1933; member of the Oklahoma State Medical Association; on the staff of Breco's Memorial Hospital; aged 36; was drowned, July 2.

Pablo Gonzalez Jr., Glendale, Calif.; George Washington University School of Medicine, Washington, D. C., 1932; aged 28; resident physician on the staff of the Physicians and Surgeons Hospital, where he died, July 23.

George Nelson Brazeau, Milwaukee; Northwestern University Medical School, Chicago, 1894, fellow of the American College of Surgeons; aged 64; died, July 13, in St. Joseph's Hospital, of carcinoma of the rectum.

Charles T. Bronaugh, New Ross, Ind.; Medical College of Indiana, Indianapolis, 1884; member of the Indiana State Medical Association; formerly county coroner; aged 82; died, July 23, of carcinoma of the throat.

John M. Prince, Miami, Fla.; National Normal University College of Medicine, Lebanon, Ohio, 1890; formerly a practitioner in Philadelphia; aged 77; died, June 21, of arteriosclerosis and cerebral hemorrhage.

George Mogridge, Glenwood, Iowa; Omaha Medical College, 1894; formerly medical superintendent of the Iowa Institution for Feeble Minded Children; aged 80; died suddenly, July 22, of pulmonary hemorrhage.

James Ward McKee, Los Angeles; Tulane University of Louisiana School of Medicine, New Orleans, 1916; served during the World War; physician for the public schools in Glendale; aged 47; died, July 16.

William T. Blanton, McCool, Miss.; University of Tennessee Medical Department, Nashville, 1891; aged 69; died, July 14, in a hospital at Memphis, of leukemia, hypertrophy of the prostate and uremia.

Archie Elmer Perkins, Fitchburg, Mass.; Hahnemann Medical College and Hospital, Chicago, 1889; member of the Massachusetts Medical Society; aged 71; died, June 14, in Gardner, of pneumonia.

Robert Yandel Shepherd, Taylorsville, Ky.; Louisville Medical College, 1907; member of the Kentucky State Medical Association; aged 57; died, June 30, of encephalitis and acute dilatation of the heart.

Joseph Omer Pichette, Montreal, Que., Canada.; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1893; aged 65; was found dead in his office, June 26.

Samuel Cecil Slocum ✠ Portland, Ore.; Cooper Medical College, San Francisco, 1900; for many years member of the city health department, and county coroner; aged 60; died, July 5, of heart disease.

Leslie Ballard Evans ✠ Windsor, N. C.; University College of Medicine, Richmond, 1900; formerly state senator; aged 67; died, July 31, in the Tayloe Hospital, Washington, of cerebral hemorrhage.

Guiseppe Romano, Cleveland; Regia Università di Palermo degli studi Facoltà di Medicina e Chirurgia, Italy, 1904; on the staff of St. John's Hospital; aged 58; was found shot and killed, June 10.

John Allen Underwood, Wilmar, Ark.; Memphis (Tenn.) Hospital Medical College, 1908; aged 61; died, June 14, in a hospital at Little Rock, of cerebral embolism and chronic nephritis.

John Henry Finnerty, Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1884; formerly member of the city board of health; aged 80; died, July 11, of cardiac decompensation.

Moses Duckman, Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894; aged 67; died, July 23, of coronary thrombosis and arteriosclerosis.

John Benjamin Dudley, Bath, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877; aged 84; died, July 21, of chronic myocarditis and arteriosclerosis.

Max Landower Rothschild ✠ San Francisco (licensed in California in 1897); medical director of the California Sanatorium, Belmont; aged 65; died suddenly, July 12, of heart disease.

Stephen J. Suwalski, Baltimore; Baltimore University School of Medicine, 1896; also a dentist; aged 77; died, June 24, in Catonville, of chronic myocarditis and arteriosclerosis.

John Francis Burns, New York; Georgetown University School of Medicine, Washington, D. C., 1925; aged 36; died, July 31, in Thompsonville, Conn., of coronary thrombosis.

Christopher J. Colles, New York; Universität Heidelberg Medizinische Fakultät, Heidelberg, Germany, 1882; aged 77; died, July 9, in the Midtown Hospital of tuberculosis.

Walter Allen Borland, Seattle; University of Oregon Medical School, Portland, 1911; aged 62; died, June 28, in the Columbus Hospital, of cardiovascular renal disease.

Charles William Strobell, San Diego, Calif.; University of Vermont College of Medicine, Burlington, 1882; aged 78; died, June 25, of coronary thrombosis.

Edwin Warren Bullock ✠ Somerville, Mass.; Harvard University Medical School, Boston, 1886; aged 73; died, July 7, of a self inflicted bullet wound.

William Blair, Ann Arbor, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; aged 66; died, July 11, of carcinoma.

John William Comfort, Kosciusko, Miss.; Memphis (Tenn.) Hospital Medical College, 1895; aged 67; died, July 12, of coronary thrombosis.

Walter Augustus Reilly ✠ Naugatuck, Conn.; Bellevue Hospital Medical College, New York, 1898; aged 60; died, June 3, of angina pectoris.

Barton L. Tupper, Glidden, Wis.; Illinois Medical College, Chicago, 1902; aged 66; died, June 22, of arteriosclerosis and myocarditis.

John Pleasant Savage, Los Angeles; Miami Medical College, Cincinnati, 1878; aged 80; died, June 12, of coronary arteriosclerosis.

Frederick Arthur Edwards, Omaha; Trinity Medical College, Toronto, Ont., Canada, 1901; aged 62; died, July 6, of appendicitis.

Jesse E. Scott, Kansas City, Mo.; Eclectic Medical University, Kansas City, 1907; aged 61; died, June 3, of coronary thrombosis.

Bureau of Investigation

THE THERMALAID QUACKERY

The Federal Trade Commission Orders the Electro Thermal Company to Cease False Claims

Toward the end of July, this year, the Federal Trade Commission issued a "Cease and Desist Order" in the matter of the Electro Thermal Company, a quackish outfit that has for some years done business from Steubenville, Ohio. One W. J. Kirk is described as the president of the Electro Thermal Company. An earlier name for the Thermalaid was "Electrothermal Dilator."

The Thermalaid was essentially a rectal dilator consisting of a hard rubber unit to be inserted in the rectum for the application of heat. The heating element was produced by an electric current, and two forms of the device were sold, one to be activated by the electric-lighting current and the other by means of a battery where a lighting circuit was not available.

The Thermalaid has been advertised and sold under the claim, either expressed or implied, that it would cure prostatic hypertrophy and diseases of the prostate. It has also been recommended as a cure for constipation and hemorrhoids (piles) and, by implication, as a sexual rejuvenator.

Wm. J. Kirk, the president of the Electro Thermal Company, is not a physician. Victims were obtained by the methods common to mail-order quacks, that of advertising in such newspapers and magazines as are willing to split the profits of quackery with fakers of this type. Advertisements of the Thermalaid in the files of the Bureau of Investigation, collected during the past few years, have come from such publications as:

Physical Culture	*True Story*
Los Angeles *Times*	*Real Detective*
Kiwanis Magazine	*Popular Stories*
Popular Mechanics	*Correct Eating*
Detroit *Mirror*	*Strength*
Police Gazette	*Modern Living*

The advertising has also carried the usual number of testimonials. One that was featured extensively was that of Dr. C. Herbert Johnston of Chicago. Dr. Johnston, according to the records of the American Medical Association, was born in 1851 and received an Illinois license in 1885, on the basis of a diploma dated the same year that he claimed to have received from the Physio-Medical Institute of Cincinnati. The diploma could not be verified, for the Cincinnati institution went out of existence the same year that it issued the diploma. While the advertisements would lead one to believe that Dr. Johnston was a prominent physician and especially qualified in the urologic field, the fact is that he is practically unknown to scientific medicine. Records in the files of the American Medical Association indicate that Johnston was once "vice-president" of a low-grade, so-called medical school that operated in Chicago. He also appears to have been a disciple of the late Dr. Albert Abrams, the dean of American quackery.

The names of two other physicians are given as having testified to the alleged virtures of the Thermalaid. One of them, who was born in 1861 and died in 1934, received his medical diploma in 1883. In addition to giving a testimonial for the Thermalaid, he also endorsed the "Magic Dot" rupture-cure quackery put out from Steubenville and debarred from the mails in the spring of 1935.

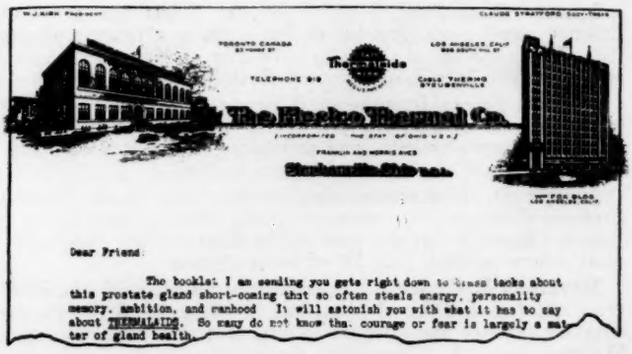
The other physician was born in 1868 and received his medical diploma in 1891. Whether the man is still alive, the records of the American Medical Association fail to show, as it has been impossible to trace his address since 1922. The files of the Association do indicate, however, that at one time the man was connected with a quackish outfit of the "men's museum" type in an eastern city, and at another time had some connection with the "Electro-Medical Scientists," operated by the notorious Ward in New York City. Still later it was reported that he had entirely given up the practice of medicine, either reputable or disreputable, and had gone into the theatrical business.

As has been so often detailed in this department of THE JOURNAL, some highly respectable banking institutions were used by the Electro Thermal Company to bolster this piece of quackery. According to the Thermalaid advertising, the following individuals, as officers of certain banks, were pleased to "testify" to their "own good opinion of the integrity, responsibility and business ability of the Electro Thermal Company." That the company was financially responsible and had business ability might readily be admitted, but does the exploiting of a quack device under false and misleading claims constitute these gentlemen's idea of "integrity?" The persons and institutions named at the end of this testimonial are:

H. M. Cattell, Treasurer of the Union Savings Bank & Trust Company
A. G. Lee, President of the Steubenville Bank & Trust Company
L. L. Grimes, Cashier of the Peoples National Bank
George J. Barthold, Secretary of the Miners and Mechanics Savings & Trust Company
W. H. McClinton, President of the National Exchange Bank & Trust Company

There was also published among the testimonials one from a Mr. Rawley W. Holcombe, who was alleged to have been the manager of the Steubenville Chamber of Commerce in 1928. Mr. Holcombe opined that the "growth and development" of the Thermalaid quackery proved conclusively that it had rendered a real service to many people and therefore Mr. Holcombe would "gladly substantiate" what the concern had "done for humanity!" Other testimonials allegedly from physicians were published, but without any names or addresses.

Part of the advertising ballyhoo of the Thermalaid was the "gift" to purchasers of the device of a booklet entitled "The Male Motor." This was said to be by "Dr. M. Sayle Taylor,


The Electro Thermal Co.
Dear Friend
The booklet I am sending you gets right down to brass tacks about this prostate gland short-coming that so often steals energy, personality memory, ambition, and manhood It will astonish you with what it has to say about THERMALAID. So many do not know that courage or fear is largely a matter of gland health

Sc.D., Ph.D., Sexologist." M. Sayle Taylor was the subject of an article in this department of THE JOURNAL March 12, 1932. Since that article appeared, M. Sayle Taylor has been much in the public ear over the radio as "The Voice of Experience." In the Bureau of Investigation article, it was brought out that M. Sayle Taylor was at that time appearing in motion picture theaters in connection with films of an erotic character and at other times gave "stage presentations" in which he used "living models" and "human charts." The Chicago *Tribune*, in writing up one of Taylor's appearances in a local theater, stated that Taylor's "message is so appallingly crude and nastily nauseating that at first the stronger stomached of the audience are inclined toward lusty laughter. However, they gradually succumb to the wizardry of his eloquence, until, at the end, they are whipped into a frenzy of morbid sensationalism." At that point, said the *Tribune* reporter, M. Sayle Taylor's high-powered salesmanship came into action, and he had for sale three paper pamphlets "dealing with the mating instinct and other problems appertaining thereto" which were sold "all for one little dollar bill." The pamphlets were passed through the audience, according to the *Tribune's* report, not by ushers but by "usherettes of apparently immature years."

Two subsidiary pieces of quackery have also been exploited by the Electro Thermal Company. One was a so-called "medicated lubricant" rejoicing in the name of "Ikthin" and sold for $1.25 a tube; the other, as might have been expected, was an alleged vitamin concentrate sold under the name "Sun Mettle —Double 20 Formula," at $5 a jar.

The Federal Trade Commission has ordered that the Electro Thermal Company cease and desist from making such claims, either through the use of testimonials, newspaper or magazine advertisements, radio advertising, etc., as: That "65 per cent of all men past middle age have prostate trouble"; That the Thermalaid is a "positive cure for any ailment"; That the

Thermalaid "constitutes a competent treatment or cure for prostatitis" or for hypertrophy of the prostate or for constipation or hemorrhoids. Various other false claims that have been made by the Electro Thermal Company the Commission has ordered shall no longer be made.

While those who realize the pernicious character of the business of the Electro Thermal Company congratulate the Federal Trade Commission in having done a public service in issuing a Cease and Desist Order, one can but regret that this business, which is carried on wholly through the United States mails, has not long before this been debarred from the use of the mails by the issuance of a fraud order.

Correspondence

VOCABULARY OF PHYSICIANS AND APTITUDE TESTS

To the Editor:—Flack, discussing "Aptitude Tests for Medical Students" (THE JOURNAL, July 4, p. 61), mentions various factors that have turned the attention of the officers of medical schools toward the possibilities of aptitude tests in solving their problems. The tests employed include a scientific vocabulary test. Yoakum (reported by Twitchell, D. F.: Report of Data Pertinent to the Problem of Selection of Medical Students, *J. A. Am. M. Coll.* **6**:357-361 [Nov.] 1931) has experimented with an exclusively vocabulary and reading test in an endeavor to predict the success of students in later medical studies. After describing the results obtained thus far in a number of medical schools, Flack concludes that "the aptitude tests have gone a long way toward solving the problem of selecting applicants to medical schools." Wechsler states that, contrary to what one would expect, the vocabulary test "is one of the best tests of intelligence; in fact, it correlates more highly with mental age than any other single test on the Binet-Simon scale. . . . In scoring the responses, elegance of definition is disregarded; any correct meaning is acceptable" (A Textbook of Clinical Neurology, ed. 3, 1935).

Terms Encountered in Garrison's History of Medicine

adumbrated	theurgy	eidetics
heuristic	lathyrism	crannogs
ephors	palimpsest	orotund
prolegomena	synectic	snaffle
iconography	proegumenic	geriatrics
ethnic	procatartic	pithiatism
couvade	synochal	camptocormy
runic	farriery	corroval
bilbo	patristic	vao
totemic	emir	latah
apotropaic	mage	myriachit
omophagy	adscripts	megrims
chthonian	farago	semantic
hieratic	marano	autochthons
vulnerary	redecraft	achorion
obsidian	hodegetics	porrigo
piebald	creese	hydroa
piacular	fictive	whiffling
syncretic	prebendary	telegony
basilisk	filigranes	heterosis
dicoric	deontology	bionomic
grigris	carricks	euthenics
scopelism	energumen	phenotype
phylacteries	osier	demiurge
periapts	triptych	espalier
mantra	mascaron	trephones
estray	electuary	cyclopia
runes	reiver	nimbus
gamy	flagitious	metaxenia
demotic	pelisse	culicidal
stela	paracutic	atrepsy
withes	bezoar	ecology
antinomies	ordure	syzygiology
sinology	cozenage	moxa
steatopygous	apozeme	recusant
faience	centupled	plinth
sherds	avatar	charades
aniconic	vectis	pythogenic
uranic	choreographic	pythoness
polonaise	zany	gambit
esoteric	mephitic	gerundive
hilastic	panada	diorama
laic	burin	thuggee
metempsychosis		dacoity

If vocabulary is to be a measure of intelligence for future physicians, Garrison pays a graceful compliment to the medical man of this generation in his celebrated History of Medicine. In this great work one encounters all the words listed in the accompanying tabulation, in the order in which they are given here. Will not every physician on meeting these familiar terms in his leisure reading feel a glow of self assurance and gain confidence that, had aptitude tests been applied in his student days, he would have scaled over them with the greatest of ease?

JOSEPH NASH, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DETERMINATION OF CARBON MONOXIDE IN AIR

To the Editor:—What is the best practical method of testing the carbon monoxide content of a room? I have a patient whose room on the third floor opens toward a narrow alley in the open rear of a commercial garage. He seems to be affected by the gas. What percentage of carbon monoxide would be considered injurious? Please omit name. M.D., Louisiana.

ANSWER.—There are several methods of analysis by which small amounts of carbon monoxide in air can be determined accurately; all, however, necessitate elaborate apparatus or involve refined analytic procedures. The most practical measure under the circumstances is to examine the patient's blood for carbon monoxide hemoglobin. The blood sample should be drawn after the patient has had maximum exposure and while he is still in the contaminated air. Most of the carbon monoxide will leave the blood during two hours in fresh air. The percentage of carbon monoxide hemoglobin can be estimated conveniently by the method described by R. R. Sayers and W. P. Yant (Method for Determination of Monoxide in Blood and Air, U. S. Bureau of Mines, 1925, Technical Paper 373; abstracted in Peters, J. P., and Van Slyke, D. D.; Quantitative Clinical Chemistry (Methods), Baltimore, Williams and Wilkins Company, 1932). Their procedure can also be used to make a fairly accurate approximation of the carbon monoxide in the air of the room. A red cell count is also recommended, as the assurance of a polycythemia will give further indication of chronic exposure to carbon monoxide.

One part of carbon monoxide in 10,000 parts of air is considered the maximum permissible concentration for prolonged exposure. But the percentage of carbon monoxide hemoglobin in the blood of the patient is a more significant value. If it exceeds 10 or 15 per cent, some physiologic effects may be observed.

PRESERVATION OF HUMAN IMMUNE SERUMS

To the Editor:—I am prepared to make serums from convalescent scarlet fever cases but would like your opinion as to the proper preservative and how long this may be kept in refrigeration. I should like any further information that you may give me on this subject. Kindly omit name. M.D., New Mexico.

ANSWER.—Four-tenths per cent phenol or tricresol has been used for many years for serums generally. This amount is recommended by the U. S. Public Health Service. The preservative is mixed with an equal part of ether before addition to the serum. Merthiolate and metaphen have been used, usually in a concentration of 1:5,000. Other organic mercurials may be employed. Some have the disadvantage of adding some color to the preparation. The National Institute of Health requirements specify nine months from date of preparation to expiration, when the serum is kept constantly at 0.4 C. Utmost aseptic precautions during processing and adequate sterility tests, both

on the individual samples and on the final pool of serum, are essential. It would be advisable to follow rigidly the requirements of the National Institute of Health in the preparation of human immune serums.

TREATMENT OF MENINGITIS

To the Editor:—Following is a report of a case of cerebrospinal meningitis with a fatal outcome. I will appreciate your criticism of my plan of therapy and any suggestions you may have to offer. I first saw the patient, a youth, aged 17 years, July 4 at 5 p. m. He had been ill with severe headache for four days. His neck had been sore, stiff and acutely retracted since the morning before, about thirty hours. I immediately did a spinal tap, at which time 45 cc. of cloudy spinal fluid was gradually allowed to drain. Thirty cc. of Mulford's antimeningococcus serum was introduced into the spinal column by the gravity method. Also 30 cc. was given intravenously. The conjunctival test for sensitivity was previously carried out and was apparently negative. At this time the patient's temperature was 103, the pulse 120, the spinal fluid cell count 2,350. He was rational. On the morning of July 5 a spinal tap was again done and 40 cc. of fluid was withdrawn, 25 cc. of Mulford's serum given intraspinally and 20 cc. intravenously. That night, ten hours later, 30 cc. of serum was given intravenously and 15 cc. intramuscularly. By the next morning, July 6, I had been able to secure meningococcus antitoxin, of which I had read and approved. A spinal tap was done and 40 cc. of spinal fluid was withdrawn and 20 cc. of antitoxin, Parke, Davis & Co., was given intraspinaly and 40 cc. intravenously. At this time there had been no noticeable change in the patient's condition since I first saw him. The case appeared hopeless. Ten hours later he received 60 cc. of antitoxin intravenously. A spinal tap was done the morning of July 7, 45 cc. being obtained and 60 cc. more antitoxin being given intravenously. Ten hours later 60 cc. more was given intravenously. I had not as yet noticed any appreciable change in the patient's condition. The morning of July 8 I found the patient free of headache, his neck was not nearly so stiff and he could move it about 15 degrees without pain. He said he felt all right. His temperature was 101.5, the pulse 104. A spinal tap yielded 40 cc. of fluid; 60 cc. of antitoxin was given intravenously. He appeared better. Ten hours later 30 cc. more antitoxin was given intravenously. The morning of July 9 a spinal tap yielded 35 cc. of fluid, and 30 cc. of antitoxin was given intravenously. A cell count of the spinal fluid was 900. The patient was much improved. Ten hours later 30 cc. of antitoxin was given intravenously, with the patient still improved. The morning of July 10 the patient could move his head about 40 degrees. He had no complaint and no headache. His neck felt all right, there was no delirium, and he had been resting and sleeping well. It seemed to me that he would recover. As a prophylactic measure against reaction I had been giving him 0.5 cc. of 1:1,000 epinephrine hydrochloride subcutaneously prior to each intravenous injection both of serum and antitoxin. The patient had had morphine sulfate one-fourth grain (0.016 Gm.) when needed for pain or restlessness from the beginning, which averaged about every six hours. The morning of July 10 his temperature was 100.5. He was in good spirits, there was no headache, the neck was more relaxed than ever, and I felt that recovery was imminent. A spinal tap yielded 30 cc. of fluid; 30 cc. of antitoxin was given intravenously. About one hour after I left the patient he became sleepy and cyanotic and wished to be fanned as fast as possible. According to his nurse, he fell into a restless sleep, breathing became deep and labored, and he died one and one-half hours after I gave him his last dose of antitoxin. I am asking you to review this entire case closely and to give me a detailed report on what you believe to have caused the patient to die. He was getting better by every criterion by which I know to gage such a case. I know of no reason for such a sudden death. Previously I have treated five cases of meningococcic meningitis. They were treated with the serum and three of the patients lived. I have never been so surprised or disheartened at the outcome of such a case as I was with this one. Please criticize my therapy closely. If you can enlighten me as to my shortcomings in treating this case or give me any information that might be of benefit in treating subsequent cases I shall be grateful.

M.D., Tennessee.

ANSWER.—It is apparent that the patient received good treatment. It seems probable that death was due to either pulmonary embolism or pulmonary edema. Such accidents have been known to occur in connection with the treatment of patients by the intravenous route.

The following suggestions are offered for treating meningococcic patients: Administer meningococcus antitoxin or antimeningococcus serum, should you prefer the latter remedy, in larger doses intravenously. Usually 100,000 units of the antitoxin or 200 cc. of antimeningococcus serum is not too much for an initial dose, which may possibly consist of all that is required. The remedy, however, when given intravenously should be diluted in approximately twice its volume. For a diluent, 10 per cent dextrose in physiologic solution of sodium chloride has been found to be satisfactory. To this mixture from 0.6 to 1 cc. of epinephrine should be added. The mixture is administered slowly at body temperature by the gravity method.

Hoyne believes that meningococcic meningitis patients respond more satisfactorily to intravenous treatment when there is no intraspinal medication. Lumbar punctures may be made when deemed advisable for the purpose of relieving pressure and checking on the progress the patient is making as a result of intravenous therapy.

Some clinicians with broad experience in the treatment of meningococcic meningitis are strongly opposed to the use of morphine for patients with such infections. As a matter of practical observation it has been noted that meningococcic meningitis patients who are given morphine do not always progress well. It is possible that morphine in these cases increases cerebral edema. Some other sedative is preferable.

PREVENTION OF IMPOTENCE

To the Editor:—I have had under observation a man, aged 21, Jewish, whose main complaint is sluggishness in obtaining an erection under conditions of sexual excitement. He says that if sufficient erection is secured for insertion he has a premature orgasm or none at all. If the sexual act is repeated, the conditions of his sexual lag or precocity absent themselves and the act is practically normal. Examination reveals evidence of a mild hyperthyroidism—palpable gland, very slight tremor, emotional instability, continuously sweating warm hands, weight loss of 10 pounds (4.5 Kg.), pulse from 90 to 100, blood pressure 140 systolic, 85 diastolic, ruddy face, and a basal metabolic rate of plus 15 and plus 10. His appetite is good but not ravenous and he states that he does not have heart consciousness. The prostate and external genitalia are those of a healthy male. The urine is cloudy with phosphates (heavy) but is otherwise negative. Blood examination reveals 100 per cent hemoglobin, 5,050,000 erythrocytes and 9,600 leukocytes. The differential count is normal. The semen has not been studied. Other physicians have given him prostatic massage and testicular extracts, he had a course of antuitrin-S consisting of twenty 1 cc. doses, with subjective decrease in nervousness, weight gain, pulse reduction to 80 and blood pressure fall to 125/75 (weekly readings). He was given iodine after the antuitrin course, which further decreased his nervousness and decreased the sweating. The sexual complaints persist. I recently had occasion to see a second patient complaining of almost the same sexual difficulties, including the improvement on repetition of the sexual act. This man had a pronounced hyperthyroidism. Thyroidectomy is obviously indicated in the second case, but the symptoms in the first case are mild so far as the thyrotoxicosis is concerned and one hesitates to advise surgery on the thyroid from that angle per se—the patient primarily wants relief from his sexual difficulties. The psychic element must be weighed in relation to his sexual complaints and this thyroidectomy might or might not improve. I am open for suggestions and advice. Please omit name and address.

M.D., Illinois.

ANSWER.—The history given is the usual one in cases of oncoming impotence; namely, first rapid ejaculation, then premature ejaculation, and finally more or less inability to obtain any erection at all. Although the statement is made that the prostate feels normal, in many of these cases an examination of the prostatic urethra with the cysto-urethroscope will reveal more or less congestion, especially about the region of the verumontanum, which may or may not be enlarged. It is not necessary to find gross pathologic change in the prostatic urethra, such as tumors, as the congestion just referred to is amply sufficient to cause the symptoms. No local anesthetic should be employed, as this might mask the congestion. The etiologic factor most often found is the indulgence in ungratified sexual excitements, such as excessive spooning with artificial holding back of ejaculation. On account of the marked congestion in the prostatic urethra, the reflex act of coitus takes place almost at once or soon after the increased congestion of sexual excitement. After this condition has lasted some time, the muscles and nerves and nerve centers connected with the sexual act become exhausted and erection fails or is very incomplete.

Orchic extracts as well as antuitrin-S can have no effect in these cases, as even normally they have no influence on the process of erection and ejaculation. For the same reason the examination of a condom specimen, while interesting for other reasons, cannot give information regarding the process of erection or ejaculation.

The treatment consists in first getting rid of the local congestions before starting any stimulating treatment. It is also absolutely important to interdict spooning or other ungratified sexual excitements. The prostate should be gently massaged and instillations of weak silver nitrate solutions (from 1:3,000 to 1:500) should be given into the prostatic urethra with the Bangs sound syringe about every five days. Generally in about six treatments the congestions are removed and often the patient is well. If not, however, this shows that the muscles and nerves have been weakened, and stimulating treatment is in order. For this purpose the sinusoidal-faradic current of moderate rapidity and as strong as the patient can bear without any pain has been suggested. One cable is connected with a rectal electrode and the other with a wet sponge electrode applied to the perineum and the current allowed to pass for about ten minutes. Treatments may be given every four days.

TREATMENT OF MENSTRUAL IRREGULARITY AND STERILITY

To the Editor:—A woman, aged 23, complains of menstrual irregularity and secondary sterility. Her periods began at 13 years of age and were always regular until a year after her marriage, at which time she had a spontaneous miscarriage at about two or three months' pregnancy. No fetus was found, but a piece of (or the entire) placenta was extruded and examined microscopically and found to be normal. Since this time, for the past year, her periods have been irregular, varying from forty to seventy days apart. Despite lack of attempts at contraception she has not become pregnant though she is very eager to do so. She is 62 inches (157.5 cm.) tall and weighs 145 pounds (66 Kg.). A thorough physical examination yields no clues as to the possible reason for her menstrual disturbance or secondary sterility. I have used amniotin, theelin and progynon-B repeatedly and frequently with no other effect than that of slightly clearing her mild acne. For a basal metabolism rate of minus 11 I have used 1 grain (0.65 Gm.) of thyroid twice a day for a period of three months with no effect on the pulse rate or weight. A rigid low calory, high protein diet with 3 mg. of thyroxine hypodermically twice a week has also done nothing to her weight. There is a tendency to girdle distribution of fat with heavy thighs. A Huhner test shows that her vaginal secretions quickly (one hour) kill the spermatozoa of her husband despite the fact that these are very numerous, motile and by themselves long living (thirty hours on a glass slide rimmed with petrolatum and at room temperature). There is a strong libido and desire for impregnation. The secondary sexual characteristics are very well developed. At the present time she has not had her period for seventy-four days and is nauseated but does not vomit. The Friedman test is negative and examination does not even lead me to be suspicious of pregnancy. I am at a loss as to what to do in this case and would greatly appreciate any suggestions you may have to offer. If you print this letter, will you please omit name? M.D., New Jersey.

ANSWER.—There are cases in which after a miscarriage a curettage is performed too radically with the result of entirely destroying the endometrium, resulting in amenorrhea and sterility. There is, however, no mention of such an operation in this case. In the absence of such a history it must be concluded that the condition is endocrine in origin. There are many factors in the history which distinctly point to such a diagnosis. The death of the spermatozoa within the vagina in an hour does not indicate anything wrong, as this condition is frequently found in normal cases. It is more important to note whether the spermatozoa reach within the cervix and remain alive there or are killed there or are stuck in the cervical mucus, as this is the main diagnostic significance of the Huhner test.

Treament should be directed on endocrine principles but is still wholly experimental. Most standard preparations state the number of rat units contained. They should be given in fairly large doses. In addition, an outdoor life with plenty of sunshine is indicated.

PAROXYSMAL TACHYCARDIA

To the Editor:—A business man, aged 37, has had repeated attacks of paroxysmal auricular tachycardia for thirteen years with increasing frequency; now they occur about once or twice a month. They are ushered in suddenly and violently, the pulse and apical rate rising to about 200 per minute. These last from two to three hours and are terminated by induced vomiting. Vagal or orbital pressure has no effect. The Wassermann reaction is negative. The patient has an aortic and mitral insufficiency with percussable cardiac enlargement. The cardiac reserve determined by exercise is low. Compensation is still established. Would you advise quinidine sulfate in the presence of this endocarditis? Would you advise choline? How is this administered? Would you give digitalis concomitantly or previous to quinidine medication? Quinidine 3 grains (0.2 Gm.) three times a day does not help. Should I increase the dose? Please omit name? M.D., New York.

ANSWER.—It is assumed that this case with a negative Wassermann reaction is one of rheumatic origin. Lesions causing aortic regurgitation are less apt to create disturbances of rhythm than those of the mitral endocardium; a postmortem examination of hearts in cases of mitral stenosis makes this easy to understand. The onset of paroxysmal tachycardia in a patient who has had rheumatic fever and who subsequently shows merely a systolic mitral murmur should make one very suspicious of mitral stenosis. It has been the experience of many that the intervals between attacks of paroxysmal tachycardia tend to shorten until, as Lewis pointed out some years ago, one comes that persists in spite of all our efforts.

Digitalis or quinidine sulfate may be used during the intervals. These drugs should be tried separately, giving the first place to digitalis, which may be used at the rate of 0.1 Gm. a day over a period of several months and the dose can be varied according to the effect on the cardiac rate. It is more valuable than quinidine sulfate, which may be tried if digitalis is unsuccessful. The patient has been given quinidine and, since he tolerates it well, it may be administered in larger daily doses. Quinidine when well borne may be given for auricular fibrillation or auricular paroxysmal tachycardia up to 1.8 Gm. a day for three or four days, after which the patient might take 0.2 Gm. two or three times daily. The usual precautions with regard to the use of quinidine in cases of long standing disturbances of auricular rhythm must be regarded. Quinidine has small value in stopping an acute attack.

Stepp and Schliephake in 1925 reported full and almost instantaneous control of paroxysmal tachycardia by using 0.5 cc. of a 5 per cent solution of choline chloride intramuscularly. More recently this drug under the name of Mecholin (Merck) has been strongly recommended for intramuscular injection during the attack. It comes in dry ampules of 0.025, 0.1 and 1 Gm. Calcium gluconate has recently been used during the attacks. It comes in 10 cc. ampules, which may be injected into the muscle. It has also been given in the intervals in wafers of 1.5 Gm. each, which the patient can use himself. It is interesting that the patient's attacks cease with induced vomiting. One cardiologist uses only ipecac to induce vomiting and in that way ends the acute attack. Lunigo many years ago advised emetine for the same purpose.

PELVIC ENDOMETRIOSIS

To the Editor:—An unmarried woman, aged 38, who weighs 120 pounds (54 Kg.), is 5 feet 7 inches (170 cm.) tall and whose parents, brothers and sisters are healthy and normal, has taught school most of her life since graduation and her habits are excellent. The menstrual period began at 13, occurs every twenty-eight days and lasts from five to seven days. On the first few days it is always very free. Twelve years ago she had an acutely inflamed appendix removed. Recovery was uneventful. She had no serious illness, accidents or other operations until eight months ago. About five years ago she began to have pain in her right shoulder; the pain appeared the first day of the menstrual cycle, the second day was better, and at the end of the cycle appeared again and lasted from seven to ten days and was very severe. This pain has increased in severity until now it almost incapacitates the patient. The pain radiates around the region midway of the clavicle and first rib. The patient describes it as being pain "deep in." At no other time of the month does this bother her. Headache usually accompanies the pain. Eight months ago, on examination, it was found that she had a mass in each side of the pelvis; the uterus was firmly fixed. At operation it was found that each ovary had undergone cystic degeneration and tumor formation; the tumor was filled with a chocolate, bloody substance, semifluid in character. The same trouble had affected the ovaries and most of the ovarian tissue was destroyed, and it was hard to eradicate the tumor and contents and leave any ovarian tissue. However, this was done and the patient has, I think, her usual amount of ovarian substance. At that time a subtotal hysterectomy was done because of some small fibroids on the uterus. All the uterine tissue possible was left. Now at each menstrual period the patient menstruates a very little with no pain or cramping, which was present before. However, she has the same unusual annoying pain in her right shoulder and so far as I can see the pelvic condition is corrected. The patient has never impressed me as typically neurotic. Her teeth are good and the tonsils are gone. There is no evidence of infection around the head any place. The urine is normal. The Wassermann reaction is negative. Her vision is good. There is no other evidence of a pathologic condition any place in her body. The unusual feature about this case is the persistent pain in the shoulder with the accompanying headache, which pain and headache appear at the end of the period and last for seven or ten days. I would appreciate some reference, data, or other information which you no doubt will be able to give. M.D., Arkansas.

ANSWER.—This patient evidently had pelvic endometriosis, and some of the disease may still persist. As is often the case, there were associated uterine fibroids.

In the presence of extensive pathologic change, such as here described, radical surgery is usually required to effect a permanent cure. If the endometriosis is extensive and the ovaries are not removed, the disease tends to progress, slowly but continuously, until after the menopause. With complete removal of both ovaries, all endometriomatous lesions atrophy and disappear. (References: Sampson: The Life History of Ovarian Hematomas of Endometrial Type, *Tr. Am. Gynec. Soc.*, 1922, pp. 47, 56. Keene and Kimbrough: Endometriosis, Obstetrics and Gynecology, edited by Curtis, Philadelphia, W. B. Saunders Company **3**:338, 1933.)

Gaseous distention of the bowel or free gas in the peritoneal cavity (such as occurs at the time of transuterine insufflation of the fallopian tubes) is the most common cause of "shoulder pain." In this case, pelvic adhesions with flatulence probably cause the right shoulder pain.

Discomfort is often more pronounced in such patients at or near the time of menstruation because the patient is at low ebb at such times, is more sensitive to pain, and is then more disposed to constipation and abdominal distention.

When the shoulder pain is acute, immediate temporary relief may be obtained by assuming a recumbent position, with the head lower than the pelvis.

Dietetic measures directed to the relief of flatulence are indicated. The patient should eat slowly and temperately and should avoid rough foods, candy, pastry and potatoes. Elimination from the bowels should be free.

PAIN IN SPINE AFTER SPINAL ANESTHESIA

To the Editor:—A woman, aged 32, of a highly neurotic nature, had a major abdominal operation about fifteen years ago for double salpingitis and removal of the appendix. She made a rather poor recovery in a nervous way and complained of abdominal distress following this operation, yet general examination revealed but little concerning her physical condition other than a marked neurosis. About five years later she was operated on again in another town and I have not been able to find out definitely just what was done at that time, but her symptoms of general neurosis, obstinate constipation, dysmenorrhea and complaint of general discomfort continued the same, yet her general physical appearance during all this time was that of a well nourished, rather obese individual. No laboratory examination revealed any definite pathologic change. In June 1934 she was sent to a charity hospital for general examination and such treatment as was indicated. The laboratory and roentgen examination made there revealed nothing of consequence but she was operated on under spinal anesthesia and many abdominal adhesions were found and removed. (From such information as I have been able to get, I think this was principally what was done at the time of the second operation.) She reports that immediately after the effect of the anesthesia passed off she began to have considerable pain about the region of the second and third lumbar vertebrae. (She was complaining much of this pain when she came home from the hospital two weeks later.) This pain has continued to date and she pretends to have much tenderness on pressure at about the region of the second and third lumbar vertebrae and says that the pain refers down the posterior and outer surface of each thigh; also that the pressure on the lumbar region mentioned increases the pain in her head. The question in my mind is Did the spinal anesthesia create a fibrosis of the cord that is making the pain or is this a generalized neurosis? I would appreciate your opinion and especially the suggestion of a treatment, as I have been unable to accomplish much in the way of relief of the patient.

M.D., Nebraska.

ANSWER.—Probably the diagnosis of neurosis, made fifteen years ago, is correct. Without any evidence of definite neurologic manifestations it is most unlikely that one could be dealing with fibrosis of the spinal cord. Spinal anesthesia probably had no specific effect on the present complaint but the reaction is one that is frequently seen in cases of this type following any surgical procedure. The question of treatment is a difficult one and the decision must depend entirely on the intelligence of the patient and on her cooperation with the physician. One of two courses might be pursued. Either her problem might be frankly discussed with her, causing her to realize the nature of her trouble, or she might go to a good sanatorium or some institution where cases of this type are often successfully treated. This patient represents a type of case in which it is well to avoid the use of a spinal anesthetic, because frequently the patient complains afterward about any one of a number of things, even resenting the fact that consciousness was maintained during the operation. There was no mention of trauma during the administration of the spinal anesthetic, which in itself might become a factor that could have a bearing in such a case.

HYPERTENSIVE DISEASE AND PREGNANCY

To the Editor:—For the past year I have been taking care of a woman, aged 34, with a marked hypertension ranging from 200 to 230 mm. of mercury systolic and from 130 to 140 diastolic. About eight months ago she miscarried a five months pregnancy and thereafter, for a few months, felt a great deal better, her blood pressure falling to 180 systolic and 110 diastolic. Her headaches have been greatly relieved by correction of a refractive error and treatment of a sinus condition. I have prescribed phenobarbital and theobromine-phenobarbital and have also used bismuth subnitrate in the recommended doses with no effect on the blood pressure. I have doubts as to the value of the "hypotensive" drugs and have not used them consistently. There does not appear to be kidney damage or myocardial insufficiency as yet. Can you suggest a rationale of treatment? What would the prognosis be? Would repeated venesections be of value? Please omit name.

M.D., Pennsylvania.

ANSWER.—It is not clear from the query how severe a hypertension existed prior to the patient's pregnancy. If the diastolic tension had been persistently in the neighborhood of 110 to 120 prior to pregnancy the patient should not have been permitted to go on to the almost inevitable miscarriage at five months. It has been emphasized repeatedly (Adair, F. L., and Stieglitz, E. J.: Obstetric Medicine, Philadelphia, Lea & Febiger, 1934, chapters XXII and XXVIII) that preexistent hypertensive arterial disease and/or nephritis are invariably greatly exacerbated by pregnancy and that this exacerbation persists permanently. The longer the pregnant state continues, the more severe and irreparable is the permanent damage. Unquestionably this is just what occurred in the present instance, there being a transient, incomplete diminution in the intensity of the hypertension because of the release from the intoxications incident to the pregnancy. It is doubtful whether any medication will prove of much value here, for it is probable that in this instance arteriolar sclerotic changes have already occurred and such damage is irrevocable, irreparable and nonamenable to therapy. The vasodilator drugs are too mild to overcome the intense intoxications responsible for the hypertension. It must be emphasized that the high blood pressure per se is but a symptom of this intoxication. Bismuth subnitrate and the barbiturates are ineffective in the presence of such active etiologic irritation.

Pregnancy causes a great change in the character of hypertensive arterial disease. A slowly progressive, relatively mild disturbance becomes rapidly aggressive and destructive. Qualitatively the disease is unaltered, but quantitatively it is tremendously accelerated in its course. The youth of the patient also tends to more rapid progression or "malignant" hypertension.

The query states that "there does not appear to be kidney damage or myocardial insufficiency as yet." One may probably take this to mean that the patient has no cardiac embarrassment or failure and that the urine is relatively free of protein and casts; but it is unjustified to say that there is no renal or cardiac impairment. In hypertensive arterial disease there is a long period of gradual reduction of the functional reserve of both the heart and the kidneys. It is a justified clinical concept to assume that such injury occurs invariably. Study of the renal functional reserve, especially with the test procedures that involve stress, such as the renal concentration test and the urea clearance test, would most certainly reveal considerable reduction of the renal reserve. So long as the renal efficiency suffices to care for the daily and usual requirements, there will be no true renal symptoms or hyperazotemia; but a great depletion of the margin of safety must occur before such decompensation. Such lowered reserve is essentially asymptomatic. The query gives no clue as to the possible etiology of the original hypertensive disease and the nephritis, which may be assumed to have existed prior to the tragically unfortunate pregnancy. For this one must dig carefully and thoroughly into the past history of the patient; the nephritic sequelae of scarlet fever often remain "latent" and unsuspected for years, to appear later as a severe renal failure or "uremia." This was recently emphasized by F. D. Murphy, John Grill and G. F. Moxon (Acute Diffuse Glomerular Nephritis, *Arch. Int. Med.* **54**:483 [Oct.] 1934).

The prognosis is bad. The life expectancy is but a few years. Therapy of many kinds has proved of little avail. Repeated venesections are decidedly contraindicated. It is more than probable that this patient has developed or will develop the highly resistant form of secondary anemia characteristic of nephritis. Repeated transfusions would be more in order, although the benefit from them is but transient.

INDUCTION OF PREMATURE LABOR

To the Editor:—Kindly discuss induction of premature labor from the standpoint of indications. A primipara, aged 21, with excellent personal and family history, had a perfectly normal pregnancy except that the weight gain was about 35 pounds (16 Kg.), from 129 to 164 (58.5 to 74.4 Kg.). Her height is 5 feet 7 inches (170 cc.). The breech position was diagnosed by the usual means and roentgen examination. There were pressure symptoms—shortness of breath and a tight feeling rather much in evidence, but decreased about a week before the date of the expected delivery. Eight days before the calculated date for delivery, labor was induced. The patient went to the hospital the same morning and delivery was accomplished by 6 p. m. A small tear necessitated one stitch. The mother's condition was excellent at all times during delivery and has been since. No instruments were used. The mother has no remembrance of labor. The child weighed 9 pounds 13 ounces (4,450 Gm.). It was born blue and did not breathe for half an hour. Then it breathed only periodically and as the result of much effort by attendants. Stimulants, artificial respiration, insufflation and carbon dioxide and oxygen were administered. It lived about thirty-six hours. Autopsy showed laceration of the superior longitudinal sinus as the cause of the condition following birth and of death. Is it considered good practice nowadays to induce labor prematurely in breech presentations when breech position is the only abnormality? If so, how long before the calculated date of delivery? Kindly omit name.

M.D., California.

ANSWER.—The indications for the induction of premature labor have changed a great deal, as the result largely of the increased safety and incidence of cesarean section. There are some who have advocated and do advocate the induction of labor on a predetermined date, but such a routine indication is not generally accepted by obstetricians. As a rule, the present day indications for inducing premature labor are maternal rather than fetal and include such conditions as toxemia and placenta praevia, which threaten the mother's life.

An induced labor is not a normal labor, though it may be so essentially if the time of induction is at term. Consequently the risk to the mother is greater and the fetus is exposed to added hazard, which is increased with the degree of prematurity.

In the case cited the child was very large, which also increased the risk, especially with a breech position in a primiparous

woman. The parturient canal must have been ample to permit of the delivery of such a large fetus without operative intervention. Death was obviously due to intracranial injury caused by the delivery of the aftercoming head. Whether this was due to resistance of the soft or bony parts of the birth canal is not apparent from the query.

It is fair to say that the induction of labor for a breech position is not an established procedure at the present time. One is doubtless justified, especially in a primiparous woman, in attempting to perform an external version and carrying it out if it is easy to accomplish.

The management of a breech labor is important, and the mechanism should never be hurried. Forceps to the aftercoming head is justifiable and may facilitate delivery of the head, prevent suffocation, and avoid injury to the central nervous system, especially the medulla and the cervical cord.

X-RAY THERAPY IN HYPERTHYROIDISM

To the Editor:—Will you please let me know what the contraindications are for high voltage x-ray therapy in hyperthyroidism? From the trend of recent literature I can find little reason not to recommend this form of treatment in preference to surgery, since it seems to be efficient in a high percentage of cases and is free from danger. The patient in whom I am particularly interested is over 30 years of age and the basal metabolic rate is plus 40 per cent, checked. He has received no iodine therapy. Symptoms of tachycardia and tremor have existed for three months. Please give medical references on this subject. Please omit name.

M.D., New York.

ANSWER.—The contraindications to roentgen therapy for hyperthyroidism revolve around the severity of the condition. If hyperthyroidism is marked and if its symptoms are pronounced, the need for measures, both medical and surgical, to improve the patient's situation as rapidly as possible is evident. On the whole, combined medical and surgical treatment, when given by some one with exceptional skill and experience, yields a higher percentage of satisfactory results than any other single method of treatment. On the other hand, if the symptoms are of moderate severity and urgent measures are not required, radiotherapy may well be tried. Such a trial involves repeated exposure of the thyroid and upper mediastinal regions to a moderate quantitative dose of roentgen rays. If, after such treatment has been continued for four months, the condition of the patient is still unsatisfactory, the advisability of continuing radiotherapy seems doubtful.

Specific references to the contraindications to radiotherapy are not available. The literature of radiotherapy for hyperthyroidism is so extensive that only the most important articles within the last few years can be included.

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MENOPAUSAL DISTURBANCE IN YOUNG WOMAN

To the Editor:—A woman, aged 30, suffered from dysmenorrhea for fourteen years, which began three years after the onset of menstruation. The periods were regular and lasted five days with pain of such intensity as to require morphine for relief. The patient had to remain in bed for two days of each menstrual period. Eight months ago it was considered advisable to remove the uterus for relief of symptoms. At operation the right ovary was found to be cystic and was also removed. Since then at intervals coinciding with the former menstrual periods the patient has complained of headaches, hot flushes, irritability and nervous tension. To use the patient's own words, she feels as though she would go to pieces if she did not hold herself in check. This last symptom is of three days' duration and has appeared at a time that would be equivalent to a week before menstruation. It is causing the patient considerable worry, since it is interfering with her work as a commercial chemist. She finds herself forced to sit down for fifteen minutes to calm herself sufficiently to continue her work. Aside from the symptoms mentioned, the patient seems to be in good health. I would value a suggestion as to treatment. Kindly omit name.

M.D., Georgia.

ANSWER.—Even though presumably one ovary was left in place, the patient seems to be suffering from menopausal disturbances. In a large number of cases, complete or partial relief from the distressing symptoms can be obtained from the use of estrogenic substance. The best way to administer this is by the hypodermic route and the patient can easily be taught how to give the hypodermics to herself, using the thighs for the sites of injection. The commercial preparations generally used in this country are amniotin (Squibb) and theelin (Parke, Davis & Co.). One ampule containing 2,000 international units of estrogenic substance should be given daily. If, for some reason, the patient cannot take a hypodermic injection each day, oral preparations of estrogenic substance may be combined with the hypodermic preparations. The oral products are known as theelol kapseals (Parke, Davis & Co.) and amniotin capsules (Squibb). The dose administered by mouth should be about five times the hypodermic dose. It is best to begin with large doses of these substances taken daily and then cut down the amounts as the symptoms subside. After a few weeks the patient will learn just how much estrogenic substance is necessary to relieve most of the distressing symptoms. In most cases these substances must be taken for many months and generally up to about two years. In this case, because the patient is only 30 years old, she most likely will have to use these preparations for a longer time. She may obtain the desired relief by taking the estrogenic substance only during the seven or ten days each month that would correspond to the premenstrual and menstrual periods. This can be determined only by experiment. In addition to estrogenic substance it is advisable to prescribe the daily or almost daily use of small doses of a mild sedative. This should be discontinued as soon as feasible.

PAGET'S DISEASE

To the Editor:—A man, aged 60, a veteran, is suffering from Paget's disease (according to x-ray observations in the right ankle). The condition sometimes is painful, and the patient walks occasionally with a limp. The trouble started during border service in 1916. The patient always has been irritable, is sort of a lone worker, and doesn't mingle well with others. He is a college graduate, also an M.D., married, and the father of six healthy children. There is no history of venereal disease. At present he is wearing protection in the heel of the shoe and is sparing the foot all he can. Please omit name.

M.D., Massachusetts.

ANSWER.—In general the treatment of Paget's disease of the bone has been most unsatisfactory except for the orthopedic measures. High doses of viosterol combined with intravenous calcium administration have apparently been used with some degree of success. Daily intravenous injections of from 5 to 10 cc. of calcium gluconate for thirty days has been recommended. After an interval of fifteen days a new series of injections for another thirty days may be given.

LIGHT NEEDED FOR STUDY

To the Editor:—This letter comes to you as an inquiry regarding school board work and for the benefit of the school children. Do you have or can you get information regarding the necessary foot candle lights required to give school children a negative eyestrain? The light companies in our district have been testing the lights in various schoolrooms and with the apparatus that they have the lighting seems inadequate, although reading is not difficult with the present lighting system. It has been stated by the light company that from 15 to 20 foot candles is the proper amount of light required for study. I would appreciate your sending me any data that you may have regarding this matter.

G. F. LONG, M.D., Braddock, Pa.

ANSWER.—The amount of light needed for study without fatigue is from 15 to 20 foot candles. The Chicago public schools are now being tested and equipped to supply 18 foot candles.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 29-July 1. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, Oct. 6-7. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Nov. 2. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: Sacramento, Oct. 19-22. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 6. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 10. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical.* Hartford, Nov. 10-11. *Endorsement.* Hartford, Nov. 24. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: Washington, Jan. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 16-17. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

GEORGIA: Atlanta, Oct. 13. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Oct. 12-15. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 20-22. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

IOWA: *Basic Science.* Des Moines, Oct. 13. Sec., Prof. Edward A. Benbrook, Iowa State College, Ames.

KANSAS: Topeka, Dec. 8-9. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY: Louisville, Dec. 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

LOUISIANA: New Orleans, December. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, Nov. 3-4. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 8. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 17-19. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Lansing, Oct. 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 6-7. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 20-22. Sec., Dr. Julian F. DuBois, 350 St. Peter St., St. Paul.

MISSOURI: Kansas City, Oct. 21-23. State Health Commissioner, Dr. E. T. McGaugh, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 6-7. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 2-4. Sec., Dr. John E. Worden, Carson City.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

NORTH CAROLINA: *Endorsement.* Raleigh, Nov. 30. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: Oklahoma City, Dec. 9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene. *Medical.* Portland, Jan. 5-7. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Sec., Board of Medical Education and Licensure, Mr. James A. Newpher, Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 10. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 19-20. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

TEXAS: Waco, Nov. 10-12. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 9-13. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WEST VIRGINIA: Wheeling, Oct. 12-14. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: Madison, Jan. 12-14. Sec., Dr. Henry J. Gramling, 2203 South Layton Blvd., Milwaukee.

WYOMING: Cheyenne, Oct. 5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, June. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written* examination will be held simultaneously in different centers of the United States and Canada in December. *Practical* or *clinical* examination will be given in St. Louis in April. Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Des Moines.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: San Francisco, Oct. 22-24. Baltimore, Nov. 15, and Cincinnati, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Application must be sent to the Secretary before Oct. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF UROLOGY: Chicago, Dec. 4-6. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

California Reciprocity and Endorsement Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports 39 physicians licensed by reciprocity and 12 physicians licensed by endorsement from June 5 through Aug. 12, 1936. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1928)	Washington
University of Colorado School of Medicine		(1933), (1934)	Colorado
University of Georgia Medical Department		(1926)	Georgia
American Medical Missionary College, Chicago		(1906)	Mass.
Chicago College of Medicine and Surgery		(1912)	Illinois
University of Illinois College of Medicine		(1928)	Illinois
Indiana University School of Medicine		(1912)	Arizona,
(1933) Indiana			
University of Kansas School of Medicine		(1933), (1935, 2)	Kansas
Johns Hopkins University School of Medicine		(1929)	Maryland
Boston University School of Medicine		(1905)	Maine
Tufts College Medical School		(1924)	New York
University of Michigan Dept. of Medicine and Surgery		(1908)	Michigan
University of Michigan Medical School		(1916)	Michigan
Hamline University Medical Department, Minnesota		(1906)	Minnesota
University of Minnesota Medical School		(1934)*	Minnesota
University of Nebraska College of Medicine		(1917)	Minnesota,
(1926), (1927) Nebraska, (1929) Kansas, (1931) Texas			
Ohio State University College of Medicine		(1927)	Ohio
University of Cincinnati College of Medicine		(1933)	Ohio
Western Reserve University School of Medicine		(1931)	Ohio
University of Oklahoma School of Medicine		(1926)	Oklahoma
University of Oregon Medical School		(1928), (1933)	Oregon
University of Pennsylvania School of Medicine		(1927)	Penna.
University of Pittsburgh School of Medicine		(1925)	Penna.
Meharry Medical College		(1922)	Louisiana
University of Tennessee College of Medicine		(1932)	Tennessee
Vanderbilt University School of Medicine		(1929), (1933)	Tennessee
Baylor University College of Medicine		(1924), (1934)	Texas
Imperial Military Medical Academy, Russia		(1899)†	Hawaii

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1935)	N. B. M. Ex.
Yale University School of Medicine		(1932)	N. B. M. Ex.
Georgetown University School of Medicine		(1904)	U. S. Navy
Emory University School of Medicine		(1930)	U. S. Navy
Northwestern University Medical School		(1934)	N. B. M. Ex.
Indiana University School of Medicine		(1909)	U. S. Army
State University of Iowa College of Medicine		(1928)	U. S. Army
University of Michigan Medical School		(1932)	N. B. M. Ex.
University of Minnesota Medical School		(1917)	U. S. Navy
St. Louis University School of Medicine		(1934)	N. B. M. Ex.
University of Pennsylvania School of Medicine		(1926)	U.S.P.H.S.
Medical College of the State of South Carolina		(1928)	N. B. M. Ex.

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

† Verification of graduation in process.

District of Columbia July Examination

Mr. J. P. Foley, assistant secretary, Commission on Licensure, reports the written examination held in Washington, July 13-14, 1936. The examination covered 10 subjects and included 60 questions. An average of 75 per cent was required to pass. Twenty-four candidates were examined, 23 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1932)	76.6,
(1935) 78.1, 80.8, 82.6, 82.8, 82.9, 83.6, 83.8, 83.8, 84, 84.5, 86.3, 88			
Georgetown University School of Medicine		(1935)	75.6,
77.1, 78, 78.5, 79.2, 82.1, 82.7, 83.7			
Ohio State University College of Medicine		(1922)	79.3
University of Virginia Department of Medicine		(1933)	84.4

School	FAILED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1935)	72.5

Six physicians were licensed by endorsement on April 6 and July 27. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1935)	N. B. M. Ex.
University of Maryland School of Medicine and College of Physicians and Surgeons		(1933)	N. B. M. Ex.
Harvard University Medical School		(1926)	N. B. M. Ex.
University of Pennsylvania School of Medicine		(1923)	N. B. M. Ex.
Medical College of Virginia		(1928)	N. B. M. Ex.
McGill University Faculty of Medicine		(1933)	N. B. M. Ex.

Book Notices

The Balanced Diet. By Logan Clendening, M.D., Professor of Clinical Medicine, University of Kansas. Cloth. Price, $1.50. Pp. 207, with 15 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1936.

This book represents a popular presentation of the essential facts of nutrition. Part I deals with the requirements of an adequate diet. It considers briefly the functions of carbohydrates, proteins, fats, water, inorganic minerals and the vitamins; it discusses the physiologic effect of spices, condiments and beverages, and summarizes the contribution to the diet made by each of the common food groups milk, eggs, bread and so on. Part II outlines the type of diet suited to different ages, the principles and procedures for diet in various diseases, and a chapter each is devoted to food fads and the economics of food. Tables of food composition and of common weights and measures are included. The content and style of the book suggest that it was written for the intelligent layman, and in large measure the volume is suited to this end. The language for the most part is simple, the style is interesting and direct, and the illustrations are pertinent and effective. Yet, like most people who attempt popular writing, the author frequently forgets his audience and talks over their heads to the physician or other scientifically trained person whom he apparently sees lurking in the background. In this vein he discusses the historical contribution of Claude Bernard, Liebig and Hoppe-Seyler, gives a technical description of the bomb calorimeter, uses such terms as "anhydrides of amino acids," "anaerobic conditions," "purine and xanthine bodies," and throws in for good measure the structural formula for an amino acid. This is not for long, however, for he soon remembers his lay audience and reverts again to his simple, effective presentation of essential nutrition material. It is unfortunate that in not a few instances some of the material included is at least by implication inaccurate or misleading. An illustration of this is found in the discussion of bread (p. 91). The average person would interpret the discussion to imply that white bread is a well balanced food, since it is stated that it "contains vitamins A, B, and G, . . . appreciable amounts of calcium, potassium, sodium, phosphorus, chlorine, sulfur and iron . . . " and "goes well with other foods, supplementing their deficiencies." As a matter of fact, bread contributes chiefly calories and protein to the diet; and (unless made of milk) the content of minerals and vitamins is so low as to be negligible when considered in relation to the body's need of these materials and in comparison with their abundance in other foods. There are, moreover, other sections in the text where the lay reader would be misled with respect to important dietary matters. Especially to commend to the perusal of the layman (and even the physician) are the discussion of what is a balanced diet in chapter I and the chapter on food fads. The doctrine of common sense in eating and the appropriate use of knowledge of nutrition in practical everyday life are here set forth with remarkable wisdom and clarity. As previously indicated, the style of the text and its graphic method of presentation are worthy of note. To the physician and the nutritionist the book will indeed be valuable chiefly for the many suggestions it affords of how scientific material can be presented in simple and graphic form.

Syphilis and Its Treatment. By William A. Hinton, M.D. Cloth. Price, $3.50. Pp. 321. New York: Macmillan Company, 1936.

This book is nearly valueless for medical students and physicians. A third is devoted to a wholly inadequate description of the clinical aspects of syphilis, of which the weakest sections are those on the two most frequent and important late manifestations, cardiovascular and neurosyphilis. A hundred pages is given to a discussion of treatment, of which only that part limited to early syphilis is satisfactory. In opposition to experts the world over, the author feels that latent syphilis should usually be allowed to go without treatment until late lesions develop, ignoring the fact that all patients with late syphilis pass through a latent stage, during which adequate treatment will prevent late manifestations. For all forms of late syphilis, including cardiovascular syphilis and neurosyphilis, a standard form of treatment utilizing an arsphenamine, a bismuth compound, mercury, and potassium iodide is proposed. He advises this plan of treatment even for dementia paralytica and states his opinion (which is in contrast to that of other observers) that the value of such special methods of treatment as tryparsamide, malaria and other forms of artificial fever have not yet been proved. A physician who attempts to treat patients with late syphilis by Hinton's methods will not only do them less than justice but subject many of them to grave danger from syphilis or its inadequate treatment.

The book is filled with statements with which other authorities do not agree. To cite only a few: Spirochaeta pallida may be grown by Noguchi's method (p. 9); the quantitative titration of serum is valueless, since some serums give a zone phenomenon (p. 29); the clinical diagnosis of primary syphilis is usually easy (p. 42); symptomless infection is usually due to seminal transmission of the virus (p. 81); the Hinton test usually persists for a lifetime in untreated late syphilis, while "most of the current Wassermann tests and the less sensitive flocculation tests . . . gradually grow weaker and become negative in five to ten years in perhaps half the cases" (p. 84); trauma has little or no influence in the production of late syphilitic lesions (p. 86); impairment of vision occasionally results from the arsphenamines (p. 218); tryparsamide has no spirocheticidal properties (p. 223).

Much space is devoted to the author's modification of the flocculation test for syphilis and to a defense of the contention that if the Hinton test of the blood is negative the cerebrospinal fluid will also be negative and examination of the cerebrospinal fluid is therefore unnecessary. This wishful thinking has been repeatedly disproved by others. No recognized syphilologic expert will agree with the author's light dismissal of the value of spinal fluid examinations in all types of syphilis. The literature is inadequately covered; only a few bibliographic references are provided, and none of the more revolutionary statements are adequately documented. There are no illustrations, but an adequate index is furnished. The book cannot be recommended.

The Story of The Middlesex Hospital Medical School. By H. Campbell Thomson, M.D., F.R.C.P., Consulting Physician to the Department for Nervous Diseases, The Middlesex Hospital. Written at the Request of the Council of the Medical School on the Occasion of the Centenary. Cloth. Price, 10/6. Pp. 182, with 52 illustrations. London: John Murray, 1935.

In at least three ways the narrative of Dr. Thomson will attract and hold the interest of the reader. Casual details and intimate quotations, like lightning flashes, reveal the customs and manners of the successive periods described. Student behavior and amusements, as well as faculty traditions and academic formalism, are sympathetically portrayed. The history of the origin and development of this school also reads like a roster of the great names in English medicine during the century of its growth. William Hunter was connected with the hospital in its earlier days. Sir Charles Bell was one of the founders of the medical school, William MacMichael, author of "The Gold Headed Cane," was a member of the staff, as was also Jonas Quain, later professor of anatomy at University College. Charles Gower, Bland Sutton, Burdon Sanderson, Lander Brunton and Alfred Pearce Gould are names known to every student of medicine. Again, the record of this institution constitutes an epitome of the history of medical education. Nearly all the problems connected with the rapid growth of the medical sciences and the need for almost continuous readjustment of teaching methods and school organization are illustrated in this story of struggle and achievement. At the outset the memorial from a committee of the staff petitioning the governors to authorize the establishment of a school recites in a manner that could not be improved on today the necessity for combining medical instruction and hospital practice to the infinite advantage of both. It is interesting to note that in 1843 there was appointed a "surgeon dentist" to the hospital. In 1896 the hospital and medical school which for sixty years had existed separately side by side were amalgamated into a single corporation. This unification was shortly followed by an affiliation with the University of London. After prolonged discussion, Middlesex rejected the proposal to transfer to the university all the teaching of preclinical sciences, a decision abundantly justified by

the subsequent development of the school. The entire story presents once again in high relief the predominantly clinical character of the London medical schools, which has been their glory and has aroused the emulation of the rest of the world.

Sex-Education. By Maurice A. Bigelow, Professor of Biology, Teachers College, Columbia University. Second edition. Cloth. Price, $1. Pp. 307. New York: American Social Hygiene Association, 1936.

This series of lectures, delivered in 1915, has been brought down to date by revisions which have done more to spoil what was originally a valuable manuscript than they have served to render it serviceable for today. Granted, as the author claims, that most of the positions he took with respect to sex education in the days when his stand required a fine courage are still tenable, the book would have been more servicable unrevised, with suitable annotations, than in its present form. There is no longer any question among open-minded persons as to "whether" with respect to sex education; the question today is "how?" In the later chapters the author arrives at a consideration of how sex education ought to be carried out and handles the topic admirably. The earlier chapters, in the light of present conditions, are tedious and repetitious, restating as they do the case in favor of sex education, a necessity twenty years ago, a redundance today. The form of presentation, as so often happens when lectures are published in book form, is neither a readable manuscript for the casual reader nor yet a textbook adequate for classroom purposes. The most useful material in the book is the chapter on bibliographies. There is an adequate index. Considerations of economy in publication, including the generous waiving of royalties by the author and the overhead by the publisher, unfortunately dictated the choice of a type too small for comfortable reading.

Die Vitamine und ihre klinische Anwendung: Ein kurzer Leitfaden. Von Prof. Dr. W. Stepp, Direktor der I. Medizin. Universitätsklinik München, Doz. Dr. J. Kühnau, Direktor des Städt. Forschungsinstituts für Bäderkunde und Stoffwechsel Wiesbaden, und Dr. H. Schroeder, Ass.-Arzt an der I. Medizin. Universitätsklinik München. Paper. Price, 6.50 marks. Pp. 130. Stuttgart: Ferdinand Enke, 1936.

This monograph affords an extraordinary amount of information in brief compass. While it is concerned mainly with recent scientific studies, it refers also to the clinical applications that have been proved or attempted with the vitamins. These dietary factors now comprise an imposing array of alphabetical letters. Among the fat soluble vitamins the authors classify and discuss vitamins A, D, E and K, the last mentioned being the antihemorrhagic factor which recent work has indicated is required by the chicken. The growth factor of Coward and his co-workers is also included in the fat-soluble group. Under the heading of water-soluble vitamins there are discussed vitamins B_1, B_2, B_3, B_4, B_5, B_6, B_7, C, H, J, and the extrinsic factor of Castle. Thus it is apparent that the authors have presented a complete study of all the factors that have been classed as vitamins, not only those that are required by man but those which have been shown or are believed to be required for the nutrition of certain animals.

As far as human nutrition is concerned, there is considerable interest to the calculations which the authors present at the end of their monograph regarding the probable daily requirements of man. Thus they calculate that the minimal adult requirements for vitamin A would be provided by 1 mg. of carotene daily; for vitamin B_1, from 0.25 to 0.50 mg. of crystalline B_1; for B_2, 1 mg. of crystalline lactoflavine; for vitamin C, from 20 to 50 mg. of crystalline cevitamic acid; for vitamin D, an unknown amount for adults but about 0.002 mg. of a crystalline vitamin D for infants.

The authors also have calculated the value of a number of foods in terms of the average weights of the various vitamins which they contain. The amount of vitamins A, B, C, D and G provided by various diets used in the treatment of disease has also been attempted. It will be noted that this treatment represents quite an advance over the unitage method of stating vitamin requirements. However, it is questionable whether such a system is reasonably well advanced for general adoption at the present time or even desirable in all cases.

It is interesting to note that the monograph closes with a brief discussion of "Schrotschussbehandlung" or "shotgun vitamin therapy."

Les hydrocéphalies aiguës et subaiguës d'origine otique: Accidents méningés otogènes purement hypertensifs. Par Robert Bourgeois. Paper. Price, 32 francs. Pp. 178. Paris: Masson & Cie, 1935.

Any contribution that is helpful in arriving at a better understanding and treatment of the often perplexing and dangerous neurologic complications of otitis is always welcomed. Bourgeois presents one of the less common of these, namely, the pathologic increase of cerebrospinal fluid. The general plan of the book includes a discussion of the neuro-anatomy, the physiology of the spinal fluid, the pathologic anatomy, the symptomatology, the diagnosis, the pathogenesis and the treatment. An attempt is made to differentiate three types of hydrocephalus, the diffuse, the ventricular and that of the posterior fossa. The chemical constitution of the fluid is usually that of diluted cerebrospinal fluid. This is one of the most important aids in differentiating the condition from abscess in which both albumin and cells are usually increased. The section on differential diagnosis is perhaps not as complete as one might wish. Treatment, depending on the location of the fluid, includes chiefly lumbar puncture, dural incision, ventricular puncture and, in all, treatment of the ear. The author does not allow the reader to become lost but frequently sums up in a pithy manner the matter that has just been presented. More than sixty illustrative cases are cited in the course of the treatise. The bibliography is ample, drawn from many sources, both native and foreign, and throughout the work the author evinces a polite consideration of the views of others.

Sex and the Love Impulse: An Outspoken Guide to Happy Marriage. By J. H. Burns, B.Sc., Principal the Children's School, Birling Gap, Eastbourne, England. Paper. Price, 50 cents. Pp. 61. New York: Emerson Books, Inc., 1936.

This pamphlet is described in its own subtitle, "an outspoken guide to happy marriage," but there is more to marriage than sex. Other aspects of marriage are not ignored, but sex is heavily emphasized. Certainly it is outspoken, and it is a guide in the sense that it gives useful information correctly. Its brevity and simplicity commend it. The necessity for basing a happy marriage on proper bringing up of the child is stressed; in this connection the author displays what might be regarded as an excessive confidence in rules, going so far as to promulgate rules for the emotions, which might be regarded as a new high in regimentation. Pamphlets of equal merit by American authors are available at lower prices.

La broncografía en el estudio de las afecciones del tórax. Por Raul Piaggio Blanco y Federico Garcia Capurro. (Trabajo realizado en las dependencias del Ministerio de Salud Pública.) Prólogo del Profesor Arce. Paper. Pp. 397, with 168 illustrations. Montevideo: Imp. "El siglo ilustrado," 1935.

This work is based on the study of 386 personal cases of thoracic disease, with a total of 434 studies by bronchography. The incidence of serious pathologic lesions is higher than ordinarily encountered in North American practice, for among these cases were nearly 20 per cent of pulmonary hydatid cysts. Fifteen per cent were cases of pulmonary suppuration. Only twelve cases out of the entire list were pronounced normal. Neoplasms, faults of development, bronchial stasis and other bronchial disturbances, bronchial dilatation, pulmonary tuberculosis, pulmonary syphilis (probable), pleural effusions, pneumothorax, subphrenic processes and postoperative conditions made up the bulk of the cases included in this study. The authors deplore the fact that so many physicians are content to limit their x-ray study of the chest to the shadows which normally utilize only the contrast between the normal opaque organs and the organs which are normally permeable to the x-rays. The employment of opaque devices, such as iodized oil, has opened an entirely new field of study. The first section of this book is dedicated to the technic, anatomy and physiology of normal bronchography and is followed by a second clinical part devoted to thoracic disorders, abundantly illustrated and adequately described. Contrary to experience with many of these publications, the quality of the paper is such as to bring out fairly satisfactorily most of the excellent illustrations. A wealth of interesting cases have been gathered together in this interesting book. Due credit has been given to the professors under whose direction the investigation has been carried out. Among them are many names distinguished in Uruguayan medicine, particularly that of Dr. Pedro Barcia, professor of radiology in the Faculty of Medicine of Montevideo.

Richtlinien für Schwangerschaftsunterbrechung und Unfruchtbarmachung aus gesundheitlichen Gründen. Herausgegeben von der Reichsärztekammer. Bearbeitet von Dr. Hans Stadler. Cloth. Price, 3.75 marks. Pp. 180, with 94 illustrations. Munich: J. F. Lehmanns Verlag, 1936.

This small monograph concerns itself with the indications for therapeutic abortion and sterilization. Edited by Dr. Hans Stadler, a government official, it presents the legal status of this problem in Germany today. The minister of health has established a special board to which cases for abortion and sterilization must be presented for approval. The many legal restrictions and laws are of no interest to physicians outside of Germany. The medical considerations for abortion and sterilization are discussed in a number of separate chapters by individual authors. Each chapter deals with a separate obstetric or medical complication. Some of these chapters are well written and cover the subject completely; others are brief outlines and are of little value. Thus, the chapter by Seitz on the toxemias of pregnancy, the chapter by Lydtin on pulmonary tuberculosis, and one by Fritz Lange on heart disease and pregnancy cover these subjects briefly but completely. In general, the indications and contraindications for abortion and sterilization are well accepted in this country. On the other hand, a long chapter by G. A. Weltz, on the value of roentgenographic observations as an aid in the decision for or against abortion and sterilization, covers a wide variety of unrelated medical conditions and is of little value. Many other conditions are covered too briefly to be of value to the reader. This monograph was written to familiarize German physicians with the present status of abortion and sterilization in Germany, and it has added little to medical knowledge.

Pathologie und Klinik in Einzeldarstellungen. Herausgegeben von L. Aschoff, H. Elias, H. Eppinger, C. Sternberg und K. F. Wenckebach. Band VII: Der endemische Kretinismus. Von Prof. Dr. F. de Quervain, Vorsteher der Chirurgischen Universitätsklinik Bern, und Prof. Dr. C. Wegelin, Direktor des Pathologisch-anatomischen Instituts der Universität Bern. Paper. Price, 24 marks. Pp. 206, with 120 illustrations. Berlin & Vienna: Julius Springer, 1936.

Professor de Quervain is chief of the surgical clinic at the University of Bern, Switzerland, and received his early training under Professor Kocher. Prof. Carl Wegelin is director of the institute of pathologic anatomy of the University of Bern. Both de Quervain and Wegelin have been intensely interested in the goiter problem, situated as they are in Bern near the center of the endemic goiter belt of Switzerland, where unfortunately a large proportion of the population is affected by a "goiter noxia" which results in cretinism. This monograph summarizes their lifelong study of the problem and presents in an authoritative manner the various clinical types of cretinism, the pathologic anatomy and histology, the pathologic physiology, the pathogenesis and the accepted methods of prophylaxis and treatment.

Your Baby and Child: A Book for Mothers. By M. C. Overton, M.D., F.A.A.P. Cloth. Price, $2. Pp. 224, with 2 illustrations. Lubbock, Texas: Your Baby and Child Publishing Company, 1936.

This is intended primarily for the mother as a guide in the general care of her infant or child. It is in no sense a medical book but a lucid and concise exposition of developmental phenomena and common ailments. The author is simple and direct in his style. The text is free from the usual formality, and the reader almost feels that he is conversing with the author. The material is recent and is in general agreement with the best medical thought. It is recommended to the intelligent mother as a guide and common sense exposition on subjects that are important and commonplace in the care of her child.

An Activity Analysis of Nursing. By Ethel Johns, R.N., and Blanche Pfefferkorn, A.M., R.N., Director of Studies, National League of Nursing Education. Prepared under the auspices of the Committee on the Grading of Nursing Schools. Cloth. Price, $2. Pp. 214. New York: The Committee, 1934.

In the first chapter the question is raised "What should the professional nurse know and be able to do?" The answers to these questions define the scope and method of the remainder of the book. Eight statements, called conclusions, but which are virtually assumptions, present the opinion of the authors as to what the professional nurse should know and be able to do. The importance attached to the public health and educational aspects of nursing is manifested here and throughout the book. The "activities" of nurses, for example, are deduced from eight lists, one of which is a "combined" list, one a list of hospital bedside nursing activities, one a list based on private duty nursing in the home, and the other five deal with various phases of public health nursing. In this light the problem of curriculum making is discussed and proposals are made for the further study of the curriculum as a continuing project. The appendix furnishes a generous collection of source material.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Jurisdiction of State Industrial Commission over Medical Fees.—In Oklahoma, said the Supreme Court of Oklahoma, the state industrial commission has no jurisdiction to make an award to a physician furnishing medical services under a written contract between such physician and the employer or insurance carrier. Where the medical services are rendered at the instance of the employee and are not contracted for by the employer or insurance carrier, and the person rendering such services seeks to hold the employer or insurance carrier liable therefor, the commission has exclusive jurisdiction to determine the existence, extent and amount of the liability. Where the medical services are rendered pursuant to an oral contract between the physician and the employer or insurance carrier, both the state industrial commission and the district courts of the state have jurisdiction to make an award or render judgment for the value thereof. The jurisdiction in such a case is concurrent. Regardless of whether the medical services were engaged by the employer, insurance carrier or the injured employee, the state industrial commission has no jurisdiction to make an award for such medical services unless a claim for compensation to be awarded the injured employee has been filed with the commission.—*Swift & Co. v. Walden (Okla.), 55 P. (2d) 71.*

Importation of Contraceptive Devices for Legitimate Use Not Illegal.—The claimant, a physician specializing in gynecology, imported a package of rubber pessaries for experimental purposes to determine their reliability and usefulness as contraceptives to cure or prevent disease. The United States sought a decree in the district court, S. D. New York, directing the forfeiture, confiscation and destruction of the pessaries on the ground that they had been imported in violation of section 305 of the tariff act of 1930 (19 U. S. C. A. section 1305), which provides:

> All persons are prohibited from importing into the United States from any foreign country . . . any article whatever for the prevention of conception.

It was not disputed that the pessaries were imported for a lawful purpose but the United States contended that the law declares illegal the importation of any articles susceptible of being used for the prevention of conception, without respect to their having a legitimate use and without regard to the intention of the importer that they are to be so used. But, said the court, such an argument was declared to be unsound in *Davis* v. *United States,* 62 F. (2d) 473, wherein the United States circuit court of appeals for the sixth district had under consideration the proper construction of sections 334 and 396, title 18, U. S. Code, Annotated, which declare it to be unlawful for any one knowingly to mail or to ship in interstate commerce any article designed, adapted or intended for preventing conception. The court in the Davis case held that these sections do not prohibit the transportation of contraceptives in interstate commerce unless they are intended for illegal use. With respect to the present case, said the court, the language contained in section 305 of the tariff act, taken literally, would seem to prevent the importation by physicians of any article for the prevention of conception, even though the physician desired to use it or prescribe it for the purpose of saving a human life. The intention to prevent such a proper medical

use, concluded the court, "is not lightly to be ascribed to Congress," quoting from *Youngs Rubber Corporation, Inc.* v. *C. I. Lee & Co., Inc.*, 45 F. (2d) 103.

The physician in the present case having admittedly imported the pessaries for a lawful purpose, the court held that they did not come within the condemnation of the tariff act. A decree was therefore entered directing the return of the pessaries to the physician.—*United States v. One Package, 13 Fed. Supp. 334.*

Crimes: Arsenic Poisoning; Demonstration of Poison in Body Not Essential to Conviction of Homicide.—Three boys became ill with nausea, vomiting, abdominal cramps and diarrhea a few hours after the ingestion of candy prepared and given to them by the defendant. A physician, although unable to diagnose their condition, prescribed a purgative and an emetic to each of them. A few days later their illness was diagnosed by another physician as metallic poisoning, probably arsenic. One of the boys died twelve days after eating the candy, and another developed "seriously drawn legs—a sort of paralysis." The defendant was convicted of first degree murder and appealed to the Supreme Court of Appeals of West Virginia.

At the trial an expert medical witness, who had made an examination and chemical analysis of the organs of the dead boy's body, testified to the effect that the stomach was covered inside with a white, sticky mucus, and was red and irritated, and that he found the lining of the stomach to be thick and inflamed. This condition, he said, was indicative of an irritating substance in the stomach and probably was caused by arsenic poisoning. He further testified that chemical analysis of the stomach, kidneys and intestines did not reveal arsenic but that, considering the time elapsed between the onset of illness and death, arsenic, if it caused the illness, might have been eliminated from the boy's system before death. The failure of the chemical analysis, said the Supreme Court of Appeals, to disclose arsenic in any of the deceased's internal organs was not conclusive that arsenic was not the cause of death. "It is obvious," said the court, "that when a person who has received poison internally lives a number of days thereafter, emetically and laxatively purged, and the kidneys functioning, the likelihood of finding traces of the poison in the system would be much less than if death had followed within a few hours." For its decision, the court relied on *Commonwealth* v. *Danz*, 211 Pa. 507, 60 A. 1070, in which the court, in discussing an expert's testimony that if vomiting occurs in a patient suffering from arsenic poisoning there will be little arsenic in the body after death, said:

> In this he was supported by medical authorities. "Arsenic is not a strongly cumulative poison. It is temporarily deposited in the liver and other organs of the body after absorption, but it is rapidly eliminated from the system by the urine, bile, and other secretions. Should the person survive for two or three weeks, no trace of poison may be found after death, in consequence of its total elimination during the interim." Reese's Medical Jurisprudence & Toxicology, 443. And it is not incumbent on the commonwealth to prove that a quantity of poison sufficient to cause death was found in the body, before a jury can be allowed to find that it was the cause of death, if the evidence sufficiently establishes the fact that the poison alleged to have caused death did kill the deceased.

Accordingly, the court concluded that the evidence justified the conviction of homicide by arsenic poisoning and affirmed the judgment of the lower court.—*State v. Koontz (W. Va.), 183 S. E. 680.*

Insanity: Criminal Responsibility in Relation to Paranoia.—The accused was charged with murder. He pleaded not guilty, and, under a provision of the California penal code, not guilty by reason of insanity. The jury found him guilty of murder and recommended imprisonment for life. A subsequent trial on the issue of the accused's sanity at the time of the commission of the offense resulted in a verdict that he was then sane. A motion for a new trial on the issue of insanity was denied and judgment rendered on the jury's verdict. The accused thereupon appealed to the district court of appeal, third district.

We are, said the district court of appeal, impelled to hold that the verdict on the issue of insanity was not supported by the evidence. The accused called ten nonexpert witnesses, who related incidents strongly indicating that the accused was insane at the time of the commission of the offense with which he was charged. There was evidence of insanity in his family supporting the theory that he probably inherited insane tendencies. Three expert witnesses, two of whom were appointed by the court, positively asserted that the accused was insane at the time of the commission of the homicide, that his mental disorder, classified as paranoia, precluded him from distinguishing between right and wrong and from realizing that it was wrong to have killed his victim and to have attempted to kill another individual. There was no substantial evidence in the record to the contrary. The prosecution produced none to rebut that advanced on behalf of the accused. The prosecution rested solely on the presumption of law that all men are presumed to be sane. A mere disputable presumption, said the court, that all men are deemed to be sane until the contrary appears from competent proof is of slight value in support of the verdict of sanity in the present case. The evidence of insanity is so convincing that the presumption of sanity is scarcely worthy of consideration. The presumption of the sanity of the accused was completely and effectually dispelled by uncontradicted evidence to the contrary. The trial court erred, therefore, in not granting the motion for a new trial. Error was committed, too, when the trial court instructed the jury that on the issue of the accused's insanity it was not necessary that the verdict of the jury be unanimous, that the issue could be decided by a three-fourths vote. Insanity, said the appellate court, is merely a separate defense to the charge of a crime. It is necessary that the jury shall unanimously determine the merits of a defense of insanity like any other defense to an alleged crime before the accused may be found guilty of the offense. The case was therefore remanded for a new trial on the issue of insanity.—*People v. Chamberlain (Calif.), 55 P. (2d) 240.*

Society Proceedings

COMING MEETINGS

Academy of Physical Medicine, Boston, Oct. 20-22. Dr. Franklin P. Lowry, 313 Washington St., Newton, Mass., Secretary.

American Association of Industrial Physicians and Surgeons, Atlantic City, N. J., Oct. 5-6. Dr. Volney S. Cheney, Armour and Co., Union Stock Yards, Chicago, Secretary.

American Association of Railway Surgeons, Chicago, Nov. 5-7. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, Richmond, Va., Oct. 26-28. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Philadelphia, Oct. 19-23. Dr. George W. Crile, 40 East Erie St., Chicago, Chairman, Board of Regents.

American Public Health Association, New Orleans, Oct. 20-23. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Society of Tropical Medicine, Baltimore, November 18-20. Dr. N. Paul Hudson, Department of Bacteriology, Ohio State University, Columbus, Ohio, Secretary.

Associated Anesthetists of the United States and Canada, Philadelphia, Oct. 19-23. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of American Medical Colleges, Atlanta, Ga., Oct. 26-28. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, Detroit, Oct. 29-31. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Association of Obstetricians and Gynecologists, Detroit, Oct. 15-17. Dr. Ralph A. Reis, 104 South Michigan Blvd., Chicago, Secretary.

Central Society for Clinical Research, Chicago, Nov. 6-7. Dr. Lawrence D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.

Delaware, Medical Society of, Rehoboth, Oct. 12-14. Dr. William H. Speer, 917 Washington St., Wilmington, Secretary.

Indiana State Medical Association, South Bend, Oct. 6-8. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, St. Paul, Oct. 12-16. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 5-8. Dr. J. V. Bell, 1103 Grand Ave., Kansas City, Mo., Secretary.

Kentucky State Medical Association, Paducah, Oct. 5-8. Dr. Arthur T. McCormack, 532 W. Main St., Louisville, Secretary.

Ohio State Medical Association, Cleveland, Oct. 7-9. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 26-30. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Oregon State Medical Society, The Dalles, Oct. 8-10. Dr. Morris L. Bridgeman, 1020 S.W. Taylor St., Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 5-8. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Medical Association, Baltimore, November 17-20. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Tri-States Medical Society of Texas, Louisiana and Arkansas, Longview, Texas, Oct. 26-27. Dr. John M. Ellis, Mt. Pleasant, Texas, Secretary.

Vermont State Medical Society, Burlington, Oct. 15-16. Dr. William G. Ricker, 33 Main St., St. Johnsbury, Secretary.

Virginia, Medical Society of, Staunton, Oct. 13-15. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

6: 33-92 (Aug.) 1936

Abdominal Pain Due to Extra-Abdominal Disorders. J. H. Musser, New Orleans.—p. 33.

Undulant Fever Associated with Abdominal Pains. A. Trumper and J. G. McAlpine, Montgomery.—p. 42.

American Heart Journal, St. Louis

12: 1-128 (July) 1936

Study of Esophageal Lead in Clinical Electrocardiography: Part I. Application of Esophageal Lead to Human Subject with Observations on Ta Wave, Extrasystoles and Bundle-Branch Block. W. H. Brown, Toronto.—p. 1.

*Thrombo-Angiitis Obliterans and Tobacco: Influence of Sex, Race and Skin Sensitivity to Tobacco on Cardiovascular Responses to Smoking. W. G. Maddock, R. L. Malcolm and F. A. Coller, Ann Arbor, Mich. —p. 46.

Relation of Systolic Blood Pressure and Heart Rate to Attacks of Angina Pectoris Precipitated by Effort. J. E. F. Riseman, Boston.—p. 53.

Ligation of Coronary Arteries in Javanese Monkeys: II. Arrhythmias and Conduction Disturbances. A. de Waart, C. J. Storm and A. K. J. Koumans, Batavia, Java.—p. 70.

*Appearance of T Wave in Lead IV in Normal Children and in Children with Rheumatic Heart Disease: Some Observations Concerning Cause of T Waves Obtained. M. Robinow, L. N. Katz and A. Bohning, Chicago.—p. 88.

Thrombo-Angiitis Obliterans and Tobacco.—Maddock and his associates point out that, from clinical observations, physicians have known for many years that tobacco smoking is harmful to patients with thrombo-angiitis obliterans. A reason for the injurious effect was found when, by means of skin temperature changes, it was shown that tobacco smoking produced constriction of the vessels of the extremities, this process further decreasing the already impaired peripheral circulation. Summarizing their observations, the authors state that the smoking of two cigarets by women resulted in a drop in the skin temperatures of their fingers and toes, and in an increase of their blood pressures and pulse rates similar to those observed in men. Cigaret smoking by Jewish males caused a greater drop in the skin temperatures of their fingers and toes than occurred in Gentile males. This fact may be of significance in accounting for the greater incidence of thrombo-angiitis obliterans among Jews than among other elements of the population. No relationship was found between skin sensitivity to tobacco and its cardiovascular effect from smoking.

T Wave in Lead 4 in Children with Rheumatic Heart Disease.—Robinow and his collaborators point out that the value of lead 4 in conditions other than coronary disease has received little attention. The preliminary report by Levy and Bruenn stimulated them to investigate more systematically the appearance of lead 4 in rheumatic heart disease. The authors felt that, since many of the patients with this disease were children, it might be advisable to determine the appearance of lead 4 in normal children of various ages and to establish criteria for comparison with children having rheumatic heart disease. The authors summarize their observations as follows: 1. Upright diphasic or polyphasic T waves in lead 4 are common in normal children, especially in the younger age groups. 2. The contour of lead 4 in normal children may change considerably when curves are repeated a few months apart. 3. Children with active rheumatic heart disease show a higher percentage of upright T waves in lead 4 than do normal children of the same age. The T wave tends to become inverted when recovery from the acute stage sets in and tends to become more upright when the disease process becomes aggravated. However, exceptions to these correlations are not uncommon. 4. An analysis was made of the factors that may be responsible for the differences in the T wave of lead 4 between children and adults, as well as between normal children and children with rheumatic heart disease. 5. The electrical field at the surface of the body during the inscription of the T wave was examined in a variety of conditions, with the result that a new view concerning the causes and significance of the upright and inverted T waves in precordial leads was revealed. 6. As a result of the present study, it is concluded that the practical value of lead 4 in children suffering from rheumatic heart disease is definitely limited. Single records in individual cases do not add valuable information, and serial curves supply data which may be suggestive and are only confirmatory to information obtained from the ordinary standard three leads.

American Journal of Clinical Pathology, Baltimore

6: 323-422 (July) 1936

Establishing Certification and Regulation of Practice of Pathology. F. M. Johns, New Orleans—p. 323.

Pathologic Study of "So-Called" Dental Tumors. C. G. Darlington and L. L. Lefkowitz, New York.—p. 330.

Determination of Iron in Minute Amounts of Blood. A. R. Rose, M. C. McCarthy, C. Blacker, F. Schattner and W. G. Exton, Newark, N. J.—p. 349.

Diabetes Mellitus, with Reference to Kidney Pathology. J. P. Tollman and E. J. Kirk, Omaha.—p. 357.

Epithelioid Carcinoma of Pancreas with Duodenal Hemorrhage. L. C. McGee, Elkins, W. Va.—p. 371.

Some Advances in Treatment of Tumors by X-Rays and Radium. G. E. Pfahler, Philadelphia.—p. 383.

Cytologic Studies of Malignant Tumors. E. von Haam and H. G. Alexander, New Orleans.—p. 394.

American J. Digestive Diseases and Nutrition, Chicago

3: 289-374 (July) 1936

Use of Chondroitin in Idiopathic Headache (Including Migraine). L. A. Crandall Jr., G. M. Roberts and L. D. Snorf, Chicago.—p. 289.

*Gastro-Intestinal Symptoms in Hypertension. S. K. Robinson, Chicago. —p. 296.

Tobacco Sensitivity in Peptic Ulcer: Second Report. I. Ehrenfeld and M. Sturtevant, New York.—p. 299.

Mesenteric Thrombosis. S. S. Berger and R. R. Blondis, Cleveland.—p. 300.

*Treatment of Peptic Ulcer by Means of Injections. C. A. Flood and C. R. Mullins, New York.—p. 303.

Epidemic of Bacillary Dysentery in the Elgin State Hospital: Preliminary Report. L. H. Block and A. Simon, Elgin, Ill.—p. 305.

Peptic Ulcer Syndrome in the Negro: Clinical and Statistical Evidence on Psychogenic as Against Racial Factors in Etiology of this Syndrome. F. Steigmann, Chicago.—p. 310.

Differentiation of Surgical and Medical Groups of Jaundice. A. A. Holbrook, Milwaukee.—p. 315.

Improved Gastric Test Meal. C. M. Wilhelmj, F. T. O'Brien and F. C. Hill, Omaha.—p. 319.

Clinical Aspects of Vitamin B Complex Deficiency in Association with Disease of Gallbladder: Report of an Instance. G. L. Weller Jr., Washington, D. C.—p. 324.

Mucous Colitis, Complicated by Colonic Polyposis, Relieved by Allergic Management: Report of an Instance. L. P. Gay, St. Louis.— p. 326.

*Selenium Toxicosis: Etiologic or Causative Factor in Pellagra? R. de R. Barondes, San Francisco.—p. 330.

II. Effect of Prolonged Administration of Salicylate on Nitrogen Metabolism and Plasma Carbon Dioxide Combining Power in Dog. J. G. Schnedorf, W. B. Bradley and A. C. Ivy, Chicago.—p. 332.

Glutamic Acid Hydrochloride as Substitute for Dilute Hydrochloric Acid in Achlorhydria. P. H. Wosika, Chicago.—p. 335.

Phenolphthalein Studies: III. Phenolphthalein and Activated Charcoal. B. Fantus and J. M. Dyniewicz, Chicago.—p. 337.

Superior Perirectal Abscesses. J. H. Allen, Philadelphia.—p. 341.

Elbow Deformity of Colon. J. M. Lynch and G. J. Hamilton, New York.—p. 344.

Gastro-Intestinal Symptoms in Hypertension.—Robinson points out that, in a clinic in which a large number of gastro-intestinal patients are seen, one is impressed with the number who have hypertension. The question arises whether these digestive complaints are not in some way related to the hypertension and its concomitant cardiovascular or neurogenic phenomena, or whether they are purely accidental and unrelated. It is recognized that hypertension is associated with nervous instability, vasomotor disturbances, migraine, colitis and hyperthyroidism. It is also recognized that some of these conditions may give rise to gastro-intestinal symptoms. The author presents a study of sixty consecutive hypertensive patients whose systolic blood pressure reached 160 mm. of mercury, or the diastolic 95 mm., or in whom a hypertensive heart was found at necropsy. Fifty-one of these patients had digestive com-

plaints during life; the other nine had some alimentary tract lesion of importance which was discovered at operation or at necropsy. Summarizing his observations, he states that, in the sixty cases of hypertension in which there were also gastro-intestinal complaints, peptic ulcer occurred twelve times, an incidence of 20 per cent. This high incidence suggests a possible relation, but the series is too small from which to draw any definite conclusion. Colitis also was frequent: it occurred nine times, an incidence of 15 per cent. Hypertension, hyperthyroidism and a lesion in the alimentary tract, such as colitis or ulcer, occurred together seven times. This strongly suggests that the concurrence of these three conditions is not accidental but that they are related and that some general disturbance of a circulatory or nervous nature is responsible for this triad. The author thinks that it is reasonable to conclude that the gastro-intestinal symptoms seen with hypertension are to a considerable extent conditioned by the cardiovascular, neurovegetative and other phenomena concomitant with the hypertension.

Treatment of Peptic Ulcer by Means of Injections.—Flood and Mullins show that the relief of pain in peptic ulcer by means of daily injections of histidine monohydrochloride has been reported by numerous workers. The statement is made that the pain usually disappears after several injections while the patients remain ambulatory and eat a normal diet. In evaluating the benefits of this method of therapy, control observations with some inert substance, such as salt solution or distilled water, usually have not been made. Such control studies are of particular importance because of the psychic factors in ulcer and also because of the tendency to spontaneous remissions in the disease. It was the object of the present study to compare a series of patients treated with histidine injections with a control group injected with physiologic solution of sodium chloride. Eighteen ambulatory patients with active duodenal ulcer were used. The diagnosis was confirmed in all cases by roentgen examination. Ten of the patients had been treated in this clinic for previous attacks of ulcer and were considered to be "stubborn cases." All patients except one had been having daily epigastric pain immediately before the onset of injection treatment. None of the group had had a recent gross hemorrhage and none had pyloric obstruction as measured by the presence of a gastric residue six hours after a barium motor meal. Twelve patients in the group were given daily intragluteal injections of 5 cc. of physiologic solution of sodium chloride. The other six patients received 5 cc. of a 4 per cent solution of histidine monohydrochloride in a similar manner. The authors found that daily injection of saline solution for a period of about three weeks was attended by relief of pain in eight of twelve patients suffering from active duodenal ulcer. Daily injection of histidine monohydrochloride was followed by relief of pain in four of six patients with duodenal ulcer. The authors suggest that the successful results in this type of therapy in peptic ulcer are due to the psychotherapeutic value of the injections rather than to the nature of the solution used. Relief of pain in peptic ulcer by injection of salt solution emphasizes the importance of the psychic factor in the disease. The evaluation of any therapy for pain in peptic ulcer should be controlled by comparison with the effect of inert substances administered in the same way.

Selenium Toxicosis and Pellagra.—Barondes states that selenium itself apparently exerts no poisonous action but that the alkali selenites and selenates are very poisonous. When animals have eaten plants poisoned by selenium, they become crippled and die in great numbers, especially on being exposed to the bright light of the sun. The disease "blind staggers" and "alkali disease" found among live stock has definitely been traced to selenium. A marked resemblance will be noted on comparing the symptoms of selenium toxicosis in animals to the symptoms of pellagra in man. The most striking of these are that: 1. Both suffer severely from gastro-intestinal disturbances and nervous and mental disorders that often terminate in complete dementia. 2. On exposure to the bright light of the sun during the spring and summer months, skin manifestations present themselves in the form of vesiculations and actinic dermatitis. The other symptoms present become more aggravated, and it is at this time that the mortality is highest. 3. During the fall months the skin commences to desquamate, and by wintertime atrophic and pigmented areas resembling vitiligo make their appearance. 4. Patients with pellagra complain often of a garlic or arsenic-like odor in the mouth and breath. A somewhat similar odor is noted on and about selenium poisoned animals. As there is a disturbed sulfur metabolism in both pellagra and selenium poisoning, and as sulfur has an affinity for selenium and vice versa, the administration of sulfur and diet rich in sulfur-containing foods would appear to be the proper curative and preventive measures to be instituted for both these disorders. The author advises that chemical examinations and spectroscopic analyses be made of the foods and soils in pellagrinous districts to determine the presence and concentration of any and all toxic substances, so that the proper study of toxic limits, tolerance limits, diagnostic symptoms and remedial measures may be undertaken, thus safeguarding the public health within the areas affected.

American Journal of Hygiene, Baltimore

24: 1-226 (July) 1936

Some Results of Six Years' Mosquito Infection Work. A. de Buck, Amsterdam, Holland.—p. 1.

The Common Cold and Effect of Rest in Bed on Its Course. T. J. LeBlanc and M. B. Welborn, Cincinnati.—p. 19.

Time Required for Examination of Thick Blood Films in Malaria Studies, and Use of Polychromatophilia as an Index of Anemia. M. A. Barber, New York.—p. 25.

*Methods of Dissecting and Making Permanent Preparations of Salivary Glands and Stomachs of Anopheles. M. A. Barber and J. B. Rice, New York.—p. 32.

*Dustless Method of Diluting and Spreading Paris Green in Malaria Control. M. A. Barber, J. B. Rice and A. Mandekos, New York.—p. 41.

Degeneration of Sporozoites of Malaria Parasite in Anopheline Mosquitoes in Nature and Its Relation to Transmission of Malaria. M. A. Barber, New York.—p. 45.

Epizootic Fox Encephalitis: VIII. Occurrence of Virus in Upper Respiratory Tract in Natural and Experimental Infections. R. G. Green and B. B. Green, Minneapolis, and W. E. Carlson and J. E. Shillinger, Washington, D. C.—p. 57.

Studies on Strongyloides: I. S. Ratti in Parasitic Series, Each Generation in Rat Established with Single Homogonic Larva. G. L. Graham, Princeton, N. J.—p. 71.

Mathematical Expression for Oxygen Consumption Following Violent Exercise. Rachel M. Jenss and N. W. Shock, Berkeley, Calif.—p. 88.

Plasmodium Oti N. Sp., A Plasmodium for Eastern Screech Owl (Otus Asio Naevius), Infective to Canaries. F. Wolfson, Baltimore.—p. 94.

Specific Action of Some Drugs on Experimental Infections of Schistosoma Mansoni. A. Giovannola, Rome, Italy.—p. 102.

Probable Relationship Between Anemia and Susceptibility to Hookworm Infection. A. O. Foster, Panama, Republic of Panama.—p. 109.

Studies on Nature of Immunity to Intestinal Helminths: IV. Interrelations Between Parenteral and Intestinal Immunity in Rats Infected with Nippostrongylus. A. C. Chandler, Houston, Texas.—p. 129.

Trichomonas Vaginalis Donné 1836: Its Morphologic Characteristics, Mitosis and Specific Identity. W. N. Powell, Temple, Texas.—p. 145.

Blood Sugar Values and Tolerance for Dextrose in Trichinosis. D. L. Augustine, Boston.—p. 170.

Variations in Children's Disease Rates Within Berkeley. J. Stuart, Berkeley, Calif.—p. 177.

Anopheles Barberi Coquillet, as Vector of Plasmodium Vivax Grassi and Feletti. W. K. Stratman-Thomas, Nicosia, Cyprus, and F. C. Baker, Ithaca, N. Y.—p. 182.

Epidemiologic Study of Protozoa Parasitic in Wild Rats in Baltimore, with Especial Reference to Endamoeba Histolytica. J. Andrews and H. F. White, Baltimore.—p. 184.

Periodic Phenomena of Asexual Cycle of Plasmodium Circumflexum in Canaries. F. Wolfson, Baltimore.—p. 207.

Concerning Transmission of Fibroma Virus (Shope) of Rabbits. R. R. Hyde, Baltimore.—p. 217.

Dissection of Mosquitoes.—Barber and Rice describe a method of dissecting mosquitoes for examination for malaria parasites. The method is accurate, rapid and easy to learn. It may be employed without the use of a dissecting microscope and enables one to examine the glands and stomachs in the fresh condition. The essential feature of the method is that the glands are pressed out of the thorax by means of a small cover-glass, under which they remain for examination. There is also described a method of making permanent preparations of glands, stomachs and a great variety of objects. Fixation, washing, preserving, staining, dehydration and final mounting are done without removing the cover-glass from the position in which it is found in the course of routine work. Excellent preparations can be made with a minimum of time and trouble.

Dustless Method of Spreading Paris Green in Malaria Control.—Barber and his collaborators describe a method of spreading paris green without the use of dust. The essential feature of the method is the use of a mixture of paris green and kerosene, the latter not serving as a larvicide alone but as a vehicle for spreading the paris green and keeping it afloat. The mixture may be diluted with water and spread by means of a horticulturists' sprayer or placed undiluted on pebbles or other convenient projectiles and thrown widely over the breeding place. The choice of method of spreading the mixture will depend on the character of the breeding place and on other conditions.

American Journal of Ophthalmology, St. Louis

19: 549-644 (July) 1936

Megalocornea: Report of Case with Gonioscopic Findings. M. U. Troncoso and I. E. Givner, New York.—p. 549.
The Chemistry of the Retina: II. Chemical Constitution. A. C. Krause, Chicago.—p. 555.
Surgical Treatment of Separated Retina by Galvanic Method. C. B. Walker, Los Angeles.—p. 558.
Histopathology of Parinaud's Conjunctivitis. H. D. Lamb, St. Louis. —p. 571.
Massive Retinal Fibrosis in Children. A. B. Reese, New York.—p. 576.
Micro-Anatomy of the Eye with the Slit Lamp Microscope: I. Comparative Anatomy of Angle of Anterior Chamber in Living and Sectioned Eyes of Mammalia: Part III. M. U. Troncoso and R. Castroviejo, New York.—p. 583.
Method for Making Casts of Human Cornea. C. L. Stevens, New York. —p. 593.
Ptosis: Report of Pedigree of Four Generations of Hereditary Congenital Ptosis Affecting Only One Eye and Pedigree of One Generation of Congenital Ptosis with Epicanthus. F. H. Rodin, San Francisco.—p. 597.

American Journal of Pathology, Boston

12: 437-572 (July) 1936

Origin and Significance of Newly Formed Lymph Vessels in Carcinomatous Peritoneal Implants. J. A. Sampson, Albany, N. Y.—p. 437.
Lesions of Cardiac Valve Rings in Rheumatic Fever. L. Gross and C. K. Friedberg, New York.—p. 469.
Histopathology of Experimental Mumps in the Monkey Macacus Rhesus. C. D. Johnson and E. W. Goodpasture, Nashville, Tenn.—p. 495.
Comparison of Behavior of Neurotesticular and Dermal Strain of Vaccine Virus in Chorio-Allantoic Membrane of Chick Embryo. G. J. Buddingh, Nashville, Tenn.—p. 511.
Comparison of Growth Curves of Malignant and Normal (Embryonic and Postembryonic) Tissues of Rat. R. Schrek, Nashville, Tenn. —p. 525.
Biologic Method for Sterilizing Contaminated Transplantable Tumors. R. Schrek, Nashville, Tenn.—p. 531.
Simple Method for Silver Impregnation of Reticulum. H. Gordon and H. H. Sweets Jr., Louisville, Ky.—p. 545.
Symmetrical Cortical Necrosis of Kidneys: Report of Case. N. Evans and E. W. Gilbert, Los Angeles.—p. 553.
Malignant Teratoma of Urinary Bladder: Report of Case. A. D. Pollack, New York.—p. 561.
Lead Hematoxylin Stain for Axis Cylinders. F. B. Mallory, Boston. —p. 569.

Lesions of Cardiac Valve Rings in Rheumatic Fever.—Gross and Friedberg describe the incidence and the gross and microscopic appearances of lesions in the valve rings and intervalvular fibrosa occurring in ninety-seven cases of rheumatic fever. They divide the cases into six clinical groups, which represent various courses taken by the disease. They show that each group presents certain general gross and microscopic features that bear a relation to the clinical grouping. Definite gross abnormalities were present in the rings of one or more valves of the heart in the first five groups. In the sixth group there occasionally appeared to be normal rings on gross examination. In general, the presence and severity of gross ring abnormalities corresponded to the extent of involvement of the remainder of the valve—the mitral, aortic, tricuspid and pulmonic being affected in that order. In the majority of instances all four valve rings showed definite abnormalities. The authors take up the microscopic appearance of rheumatic valve rings in each of the six groups and there consider the mechanisms that may lead to the involvement of the valve rings. They present new macroscopic and microscopic data on the development of the rheumatic lesions in the valve rings and discuss their significance with regard to the spread of the rheumatic infection to and from these sites. They show that their own observations, as well as those previously reported, are of value in elucidating the pathogenesis of other cardiac lesions. As the valve ring constitutes the proximal portion of the valve leaflet, the ring lesions are of considerable significance in studying the development of rheumatic valvulitis. A description is given also of the changes that take place in nonrheumatic valve rings during the first eight decades of life.

American Review of Tuberculosis, New York

34: 1-178 (July) 1936

Vicissitudes of Auscultation: Address of the President. J. J. Waring. —p. 1.
BCG Vaccination in Western Europe. G. G. Kayne, London, England. —p. 10.
Epidemiology of Tuberculosis in Kingston, Jamaica: Study of Infection as Indicated by Tuberculin Test. C. W. Wells and H. H. Smith, Kingston, Jamaica, B. W. I.—p. 43.
*Incidence of Tuberculosis in Children Entering Primary Schools in Vancouver, British Columbia: Attempt to Trace Their Sources of Infection with Suggested New Approach to Case Finding. A. R. J. Boyd, Vancouver, B. C.—p. 67.
Contact as Factor in Transmission of Tuberculosis. C. Schuman, New York.—p. 85.
*Latent Sources of Contact in Tuberculosis. B. R. Shurly and D. S. Brachman, Detroit.—p. 96.
Efficacy of Tuberculosis Control: Statistical Analysis. M. Pollak, Peoria, Ill.—p. 107.
Pulmonary Asbestosis and Carcinoma: Report of Case with Necropsy Findings. D. S. Egbert and A. J. Geiger, New Haven, Conn.—p. 143.
Agranulocytic Angina Following Sanocrysin: Case Report. S. Schwartz and F. H. Heise, Trudeau, N. Y.—p. 151.
Results of Sanocrysin Treatment of Tuberculosis. F. I. Terrill, Deer Lodge, Mont.—p. 156.
Accidental Pneumoperitoneum in Artificial Pneumothorax Therapy. C. E. Hamilton and P. Amazon, Brooklyn.—p. 160.
Observations on Red Cell Sedimentation Test in Pulmonary Tuberculosis. H. A. Patterson, Fort Stanton, N. M.—p. 164.
Hydrogen Ion Concentration of Blood in Pulmonary Tuberculosis. E. R. Wiese, Chestnut Hill, Pa.—p. 175.

Tuberculosis Among Primary School Children.—Boyd undertook the study in the first place to determine the feasibility of examining whole families, in an effort to explain the occurrence of tuberculous infection and demonstrable tuberculous lesions in a group of 1,143 children entering primary schools. He also attempted to determine the sources of tuberculous infection in children entering primary schools. In tracing the sources of infection it is obviously impossible to deal with casual contacts. These children have not been at school a sufficient length of time to have the number infected appreciably changed by contact with other pupils and with teachers. The incidence of positive tuberculin reactions in the 1,143 children was found to be 19.86 per cent. For 1,001 children aged 6 years the incidence of positive reactors was 20.08 per cent, for girls 20.70 per cent and for boys 19.49 per cent. The majority of positive reactors were not sensitive to 0.1 cc. of 1:1,000 dilution of old tuberculin. The incidence of infection increased with increasing density of population. Demonstrable tuberculous lesions were found in the roentgenograms of 13.22 per cent of positive reactors, which was equivalent to 2.49 per cent of the whole group. Of fifty-one children sensitive to 0.1 cc. of 1:1,000 dilution of tuberculin, twenty had positive roentgenograms. The incidence of tuberculous lesions demonstrable roentgenologically was seven times as great for those with 3 plus reactions as for those with 1 plus reactions. Of seventy-two families investigated, a source of infection was found in twenty-one. Of twenty-one patients with the disease in the primary form nineteen were adults and two were children aged 15 years with the adolescent type of disease. Seven new primary cases were diagnosed among 111 adults, while one new primary case was diagnosed among 141 children. All the newly discovered primary cases were minimal, six being active and two apparently healed. Search for a primary case in the families in which young children react to tuberculin is a feasible method of tuberculosis case finding. Further investigation in other centers may show this method to be of practical value to school and municipal health units.

Latent Sources of Contact in Tuberculosis.—Shurly and Brachman find that tuberculosis may be active for weeks and sometimes for several months before producing recognizable symptoms. Apparently healthy people unaware of having the disease may therefore act as tuberculosis carriers. From the adolescent age onward such carriers are not infrequently found wherever people congregate in large numbers. Tuberculosis is more likely to spread where people gather regularly, whether for work, education, recreation or food. Some people knowingly

having active disease become a latent source of contact in deliberately masking their symptoms by calling their condition "bronchitis," "bronchiectasis," "pulmonary abscess" and the like. The authors recommend that boarders or lodgers should not be accepted, particularly in homes where there are children, without a roentgenogram of the chest first being taken. Teachers and other school workers should be required to have a roentgenogram with or without a preceding tuberculin test. High school and college students should be required to go through tuberculin test x-ray screening before being accepted for athletic teams. Modern case finding methods should be required in all places at which people gather regularly. Rehousing is strongly recommended in every so-called slum area. More education is advisable among some foreign nativity groups along the lines of inducing them to take advantage of hospitalization. Physicians may well carry out a tuberculin x-ray case finding program among the general population, especially from the adolescent ages upward, and particularly in the poor sections of large cities where there is overcrowding. Approximately 1 per cent of this group will be found to have the adult type of tuberculosis.

Archives of Dermatology and Syphilology, Chicago

34: 195-352 (Aug.) 1936

Nevoxantho-Endothelioma or Juvenile Xanthoma. F. E. Senear and M. R. Caro, Chicago.—p. 195.
Trichophytin and Allergy to Trichophytin: I. Comparison of Cutaneous Responses to Two Standard Preparations of Trichophytin and to Dermatomycol (Da Fonseca and De Arêa Leão). M. B. Sulzberger, G. M. Lewis and F. Wise, with assistance of Mary E. Hopper, New York.—p. 207.
*Sodium Thiosulfate in Treatment of Scabies. G. V. Kulchar and W. M. Meininger, San Francisco.—p. 218.
Eczema Due to Dyed Clothing: Report of Fifteen Cases. P. Bonnevie and V. Genner, Copenhagen, Denmark.—p. 220.
Fatal Iododerma: The Eleventh Case Reported in the Literature. L. Hollander and G. H. Fetterman, Pittsburgh.—p. 228.
Extensive Ulceration in Wholly Untreated Syphilis. L. F. X. Wilhelm and J. R. Scholtz, Los Angeles.—p. 242.
Erythroplasia of Queyrat in a Negro: Report of Case. S. Irgang and E. R. Alexander, New York.—p. 247.
Dermatitis Due to Tryparsamide: Report of Case. S. S. Robinson, Los Angeles.—p. 251.
Vitamin C Content of Sweat. T. Cornbleet, R. I. Klein and E. R. Pace, Chicago.—p. 253.
*Paratherapeutic Articular Disturbances. V. Genner, Copenhagen, Denmark.—p. 255.
Pigmentary Form of Verruca Plana. S. W. Becker, Chicago.—p. 265.
Tri-Ethanolamine: Adjunct to Dermatologic Therapy, with Especial Reference to Ringworm of Scalp. M. T.-R. Maynard, San José, Calif.—p. 268.

Sodium Thiosulfate in Treatment of Scabies.—Kulchar and Meininger direct attention to a recent report by Ravaut and Mahieu, in which those authors described the successful treatment of scabies by the precipitation of colloidal sulfur on the skin through the interaction of sodium thiosulfate and an acid. The treatment is carried out as follows: The patient is directed to take a soap and water bath. After he is thoroughly dry, a 40 per cent aqueous solution of sodium thiosulfate is applied over the entire body except the head and face; particular attention is paid to the areas between the fingers, to the flexural surfaces of the wrists, and to the breasts, abdomen, buttocks, thighs and external genitalia. Fifteen minutes later 4 per cent hydrochloric acid is applied in a similar way, and one hour later the applications are repeated in the same order. The procedure is repeated the next day; on the following day the patient again bathes and changes to fresh clothing. All bed linen, sleeping garments and clothing previously used are sterilized by boiling for five minutes. As the solutions are stable, they may be made up in large quantities and dispensed as needed. Four ounces (120 cc.) of each solution is sufficient to carry out the treatment. The authors used sodium thiosulfate in treating fifty patients with scabetic infestations of all degrees of severity. As a control, fifty patients were treated with an ointment prepared in the manner described by Greenwood. They reach the conclusion that the precipitation of colloidal sulfur on the skin by the interaction of a 40 per cent aqueous solution of sodium thiosulfate and a 4 per cent solution of hydrochloric acid provides a simple, effective and economical method of treating scabetic infestations.

Paratherapeutic Articular Disturbances.—Genner says that the term paratherapeutic articular disturbances is used to designate morbid articular conditions that develop in connection with antisyphilitic treatment either during or subsequent to a series of injections (as a rule arsphenamine and bismuth) involving two toxic factors. On the basis of his investigation the author concludes that the paratherapeutic articular disorders are in a great majority of cases due to the administration of bismuth compounds and only in exceptional cases to the administration of arsphenamine. This conclusion is derived from an analysis of seventy-nine cases in a total of 2,235 cases in which antisyphilitic treatment was given. Cases of arthralgia were not recorded until arsphenamine-mercury treatment was replaced by arsphenamine-bismuth treatment. The articular pain was aggravated by continuation of the bismuth treatment, so that this form of therapy had to be discontinued in a fairly large number of cases. The pain subsided when the bismuth therapy was discontinued. In only 4 per cent of the cases of articular disturbance did the symptoms begin to appear during or after a series of treatments with arsphenamine; in 54 per cent it appeared during or after a series of treatments with arsphenamine and bismuth compounds and in 42 per cent during or after a series of treatments with bismuth compounds alone. The last mentioned evidence concerning the connection between the articular pain and the bismuth intoxication is further emphasized by the fact that the onset of arthralgia is predominantly intratherapeutic (75 per cent), appearing often within a short time (from one to a few days) after an injection of a bismuth compound, and it is accentuated by each subsequent injection of this substance. An analysis of the individual cases showed several instances in which articular pain first appeared during a course of combined treatment (arsphenamine and bismuth compounds) and subsided when the treatment was continued with arsphenamine alone, while it recurred when a bismuth compound was again given.

Archives of Neurology and Psychiatry, Chicago

36: 231-448 (Aug.) 1936

Reacting Cells in the Brain in Presence of Foreign Body. G. B. Hassin, Chicago.—p. 231.
Congenital Atresia and Stenosis of Aqueduct of Sylvius: Anatomic Study of Six Cases. H. N. Roback, New York, and M. L. Gerstle Jr., San Francisco.—p. 248.
*Cortical Encephalomalacia in Infancy: Contribution to Study of Infantile Cerebral Paralysis. P. M. Levin, Baltimore.—p. 264.
Clinicopathologic Study of Alzheimer's Disease: Relationship to Senile Conditions. D. Rothschild, Foxborough, Mass., and J. Kasanin, Howard, R. I.—p. 293.
Feeling of Unreality. C. P. Oberndorf, New York.—p. 322.
*Insulin Hypoglycemia in Epilepsy. E. Ziskind, with technical assistance of Ruth Bolton, Los Angeles.—p. 331.
Influence of Emotions on Dextrose Tolerance. O. Diethelm, Baltimore.—p. 342.
Vasomotor Disturbance and Edema Associated with Cerebral Hemiplegia. L. B. Ellis and Soma Weiss, Boston.—p. 362.
Specific Epileptic Syndrome Relieved by Lysis of Pacchionian Granulations: Preliminary Report of Three Cases. J. E. Scarff, New York.—p. 373.
Constancy of Cerebral Blood Flow. W. G. Lennox, Boston.—p. 375.

Cortical Encephalomalacia in Infancy.—According to Levin, the cerebral palsies of childhood have been intensively studied clinically and have been divided into a number of fairly characteristic categories. Knowledge of the pathology of this group of common neurologic conditions has not kept pace with clinical studies. The few patients who have died during acute stages of the illness showed on postmortem examination conditions other than inflammation. The author reports a clinicopathologic study of the case of an infant with convulsive attacks and hemiplegia. At necropsy, multiple areas of encephalomalacia were seen, limited to the cerebral cortex. Definite arterial lesions were present, but they were not sufficiently severe to be alone responsible for the parenchymatous lesions. The condition was similar in many respects to that in other cases recently described, and the author thinks that it represents a not uncommon pathologic basis for infantile cerebral paralysis. The case concerns an infant with convulsive seizures beginning at the age of 4 months and hemiplegia beginning at the age of 9 months. Death occurred in the ninth month from circulatory and respiratory collapse after trephining of the skull. On pathologic examination of the brain, multiple laminar softenings were noted throughout the cerebral cortex, most marked in the parietal region of each side. The pial arteries showed calcification of the media; intimal proliferation was present in these vessels and in the large basal arteries. In the areas of softening

there were a marked proliferation of the capillaries and an abundance of phagocytic cells containing fat. About the vessels were accumulations of cells, from which gradations could be traced to the fat-laden macrophages. The condition appears to represent an early stage in the development of diffuse or lobar cerebral sclerosis, a common lesion in infantile cerebral paralysis. The lesions appear to be due to alterations in the circulation of the cerebral cortex. Actual vascular occlusion is rarely found, and it is believed that vasomotor disturbances may play an important part in the pathogenesis of this disease.

Insulin Hypoglycemia in Epilepsy.—Ziskind and Bolton point out that reports of many studies have appeared in the literature suggesting that epileptic attacks may be due to hypoglycemia. On the whole, the evidence has been indirect and not conclusive. The injection of insulin is known to induce convulsions in several species of animals. In fact, insulin was formerly assayed in rabbits by this method. Convulsions resulting from an overdose of insulin are of infrequent occurrence in adult human beings. Still, if hypoglycemia bears any etiologic relation to the seizures of epilepsy, one would expect insulin to produce convulsions in these patients more readily than in normal persons. Indeed, the direct induction of hypoglycemia in a group of epileptic patients might present the crucial evidence necessary to a solution of the problem. The authors report their investigations on this problem. They found that insulin administered subcutaneously in doses of from 10 to 60 units to forty epileptic patients was not accompanied by convulsions in a single instance. Superhydration produced by the intake of 7 quarts (liters) of water at the rate of 1 quart every thirty minutes in addition to injection of insulin was accompanied by four convulsions in the thirty epileptic patients tested. The convulsions did not coincide with the lowest blood sugar concentrations. Further, the same number of convulsions resulted in thirty-one epileptic patients in whom superhydration alone was produced. Spontaneous hypoglycemia is probably not a prevalent factor in the precipitation of seizures in epileptic patients. Convulsions occurred in one fourth of the patients receiving large quantities of water.

Archives of Ophthalmology, Chicago

16: 1-172 (July) 1936

Subjective Visual Sensations. G. L. Johnson, Durban, Natal, South Africa.—p. 1.
Transitory Word Blindness Associated with Right Homonymous Hemianopia: Report of Case in Patient with Cancer of Prostate Gland. H. G. A. Gjessing, Drammen, Norway.—p. 5.
*Relation Between Blue Scleras and Hyperparathyroidism. A. Rados and L. C. Rosenberg, Newark, N. J.—p. 8.
Partial Rupture of Lamina Cribrosa from Contusion of Eyeball. A. Tillema, Amsterdam, Netherlands.—p. 36.
Human Cyclopia. Katharine H. Chapman, Chicago.—p. 40.
Melanocarcinoma of Conjunctiva: Report of Case. W. E. Vandevere and M. P. S. Spearman, El Paso, Texas.—p. 46.
Filtration Experiments with Virus of Inclusion Blennorrhea. Evelyn B. Tilden and S. R. Gifford, Chicago.—p. 51.
Epithelial Inlay in Cases of Refractory Ectropion. J. F. S. Esser, Monaco, Monaco.—p. 55.
Biochemistry of Lens: VII. Some Studies on Vitamin C and Lens. J. Bellows, Chicago.—p. 58.
Circulation of Aqueous: V. Mechanism of Schlemm's Canal. J. S. Friedenwald, Baltimore.—p. 65.
Isaac Hays: Pioneer American Ophthalmologist. N. Flaxman, Chicago.—p. 78.
Marginal Dystrophy of Cornea Associated with Prolapse of Iris. W. Zentmayer, Philadelphia.—p. 91.
Primary Tumor of Optic Nerve: Report of Three Cases. G. H. Mehney, Ann Arbor, Mich.—p. 95.

Relation Between Blue Scleras and Hyperparathyroidism.—Rados and Rosenberg state that the clinical entity consisting of blue scleras, osteoporosis with spontaneous fractures and deafness and the dominant hereditary transmission of the syndrome have long been known to ophthalmologists and pediatricians. In recent years many authors have considered that alteration in the ductless glands may be the causative factor; others have made an attempt to explain the syndrome as entirely caused by hypofunctioning of the parathyroid glands, involving hypocalcemia. In contradiction of this view, Dessoff pointed out the possibility that hyperparathyroidism might be the sole cause. The authors have made a detailed study of two cases and say that their metabolic study strongly confirms the decided differences in the pathologic osseous conditions existing in hyperparathyroidism and those associated with blue scleras. In the usual cases of blue scleras associated with spontaneous fractures and hereditary deafness there are not sufficient variations in the values for calcium, phosphorous and phosphatase to warrant a supposition of involved endocrine disturbance. In osteogenesis imperfecta there is evidence of decided hereditary transmission, in contrast to hyperparathyroidism, which shows no such influence. Cystic fibrous osteitis is based on hyperactivity of the parathyroid glands, the usual cause being tumor formation within the glands, resulting in mobilization of the supply of calcium. The spontaneous fractures occur in adult life and are accompanied by a negative calcium balance, cyst formation and giant cell tumors of the bones. The small minority of cases in which blue scleras are associated with proved parathyroid disorder are rare exceptions, the pathologic features not constituting the usual picture. The most plausible explanation lies in the possibility that the condition of hyperparathyroidism has been superimposed on a preexistent congenital anomaly. Similarly, spontaneous fractures are clinical features of the other form of generalized osseous disease, osteogenesis imperfecta, associated with blue scleras and deafness. They occur in utero or in infancy or childhood, in contradistinction to the adult age incidence of hyperparathyroidism. The roentgenographic picture of the osseous condition is that of osteoporosis. There are absence of a negative calcium balance and lack of increased phosphatase activity in osteogenesis imperfecta, the latter being a distinguishing feature of the parathyroid syndrome. Furthermore, blue scleras are characterized by dominant hereditary transmission and are due to a congenital faulty differentiation or malformation of the mesenchyma.

Endocrinology, Los Angeles

20: 461-610 (July) 1936

*Treatment of Diabetes Mellitus with Insoluble Insulin Compounds. P. A. Gray, Santa Barbara, Calif.—p. 461.
Effect of Oestrogenic Hormone on Experimental Pancreatic Diabetes in the Monkey. W. O. Nelson and M. D. Overholser, Columbia, Mo.—p. 473.
Effect of Complete and Partial Hypophysectomy in Adult Albino Rats on Nitrogen, Calcium and Phosphorus Metabolism. D. Perla and Marta Sandberg, New York.—p. 481.
Composition of Weight Lost and Nitrogen Partition of Tissues in Rats After Hypophysectomy. M. Lee and G. B. Ayres, Boston.—p. 489.
Effect of Hypophysectomy and of Phyone Injections on Pancreas and Liver of Newt. A. Elizabeth Adams and Elsie N. Ward, South Hadley, Mass.—p. 496.
Quantitative Studies on Structural Changes Induced in Anterior Hypophysis by Injections of Estrin. J. M. Wolfe and C. S. Chadwick, Nashville, Tenn.—p. 503.
Relationship of Anterior Pituitary Gland to Thyroid and Ovary. L. Loeb; J. Saxton and S. J. Hayward, St. Louis.—p. 511.
Assay of Blood and Urine for Thyrotropic Hormone in Thyrotoxicosis and Myxedema. S. Hertz and E. G. Oastler, Boston.—p. 520.
Similarity of Iodine Remission in Experimental Anterior Hypophyseal Hyperthyroidism, Hyperthyroidism of Acromegaly and That of Exophthalmic Goiter. H. B. Friedgood, Boston.—p. 526.
*Influence of Pregnancy on Resistance to Thyroxine, with Data on Creatine Content of Maternal and Fetal Myocardium. M. Bodansky and Virginia B. Duff, Galveston, Texas.—p. 537.
Age as Factor in Resistance of Albino Rat to Thyroxine, with Further Observations on Creatine Content of Tissues in Experimental Hyperthyroidism. M. Bodansky and Virginia B. Duff, Galveston, Texas.—p. 541.
Analyses of Urine of Chimpanzee for Estrogenic Content During Various Stages of Menstrual Cycle. E. Allen; A. W. Diddle; T. H. Burford and J. H. Elder, New Haven, Conn.—p. 546.
Rôle of Corpora Lutea in Prolonging Life of Adrenalectomized Rats. F. E. Emery and E. L. Schwabe, Buffalo.—p. 550.
Influence of Environmental Temperature and Salts on Survival Period of Adrenalectomized Rats. R. S. Weiser and E. R. Norris, Seattle.—p. 556.

Treatment of Diabetes Mellitus with Insoluble Insulin Compounds.—Gray points out that in 1935 Bischoff and Maxwell reported that tannic acid was an effective precipitant of hormones of protein character and that the resulting salt was biologically more effective than the uncombined hormone. When commercial insulin was combined with tannic acid, a salt formed which was absorbed more slowly and had a more prolonged effect on the blood sugar of experimental animals than did the insulin alone. The effect was so striking that the question of its application to the treatment of diabetes in human patients immediately arose. Insulin tannate is a salt of insulin which is insoluble in the presence of sodium chloride at a p_H acid to the iso-electric point. It is prepared by mixing

in a hypodermic syringe equal volumes of U-100 strength insulin and a tannic acid solution. The resulting mixture contains 3 mg. of tannic acid per hundred cubic centimeters. It has about 20 to 25 per cent more hypoglycemic action per unit than commercial insulin. Eighteen patients of various ages and with diabetes of varying degrees of severity have been treated with insulin tannate for periods varying from a few days to two weeks consecutively. Control of the diabetes has been possible when this compound is used alone or in combination with commercial insulin. Because of the relative insolubility of insulin tannate in human and animal tissues, delayed absorption and hence prolonged liberation of free insulin occur. Increased effectiveness of insulin tannate over commercial insulin is shown by lower fasting blood sugar levels and smaller number of total units required per day when it is used. The hypoglycemic effect of insulin tannate has been compared to that of insulin protaminate and found to be of about the same order. The cheapness and availability of insulin tannate recommend it.

Pregnancy and Hyperthyroidism. — Bodansky and Duff found that pregnant rats possess a remarkable tolerance to thyroxine. Despite the administration, subcutaneously, of 1 mg. daily during the last ten to twelve days of gestation, such rats showed almost the same gain in weight as their untreated pregnant controls. However, a comparison of the weights before the thyroxine treatment was instituted and at the end of labor revealed a moderate loss in most cases, in contrast to the usual, absolute gain in weight of the control rats. The nonpregnant, thyroxine treated controls invariably lost weight. In a considerable proportion of the thyroxine treated rats the gestation period was normal. The number per litter was approximately the same, but the weight was somewhat less in the thyrotoxic group. A much greater incidence of stillbirths occurred in the thyroxine treated rats than in the normal controls. Although hyperthyroidism in the mothers produced a marked diminution of the creatine content of the myocardium and cardiac hypertrophy, no similar effects were produced on the fetal hearts, the size and creatine concentration being within normal limits.

Georgia Medical Association Journal, Atlanta

25: 225-266 (July) 1936

Thyroid and Parathyroid Problems: Chronic Hyperthyroidism with Persistent Low Basal Metabolic Rate. T. C. Davison, Atlanta.—p. 225.

Id.: Goiter in Children. J. G. Gay, Atlanta.—p. 228.

Id.: Goiter and Iodine. B. H. Clifton, Atlanta.—p. 230.

Id.: Hyperparathyroidism. J. R. Broderick, Savannah.—p. 232.

Cancer of Cervix. J. A. Fountain, Macon.—p. 238.

To What Extent May Hormones Be Blamed for Cancer? Importance of Basal Genetic Propensity. C. P. Roberts, Atlanta.—p. 242.

Bromide Intoxication: Report of Cases. W. G. Elliott, Cuthbert.—p. 245.

*Antenatal Administration of Quinine. L. Smith, Atlanta.—p. 247.

Antepartum Administration of Quinine.—Smith resorted to antepartum administration of quinine salt in sixty normal pregnant women. He shows that quinine administered in small doses for three weeks before the expected onset of labor will increase the basic tone of the uterine muscle fibers and thus reinforce contractions. The increased tone of the muscles will hasten the development of the lower uterine segment and more positively develop the hydrostatic bag of waters, which will earlier efface the cervix and dilate the os. The general health of the patients is definitely improved by small doses of quinine; their appetite is improved and indigestion and heartburn, of which many complain in the late stages of pregnancy, are often entirely or greatly relieved. In the cases observed by the author, the first stage of labor took place painlessly, and in many cases the first obstetric examination revealed an almost complete dilatation. In none of the cases did the obliteration of the cervix and dilatation of the os take as long as usual. Moreover, the author as well as other observers noted a lower frequency of fever in the women who had been given quinine. There was no puerperal sepsis among the author's cases, nor did he observe more than a normal flow of blood after delivery. He stresses that in no sense should this method of administering small doses of quinine be considered a method of inducing labor and he believes that it is now agreed by pharmacologists and clinicians that quinine is not an oxytocic nor is it of any value in inducing labor. There was no apparent tendency of these patients to go into labor prematurely, and the estimated dates of confinement varied both ways just as the cases did in which no quinine had been given. The author did not have a case of precipitate labor, although several patients were delivered in a remarkably short time. There was no case of retained placenta in this series, and the number delivered by Credé's method was thirty-seven, whereas in a similar group not quininized the author delivered fifty-two by this method. Only normal cases were selected for the quinine treatment. There is probably a large field for this treatment in abnormal cases, but further experience is needed. When a long, slow labor is desired, so that the head may be molded or the passage be dilated more slowly, this treatment is contraindicated. The author used quinine dihydrochloride in doses of 1½ grains (0.1 Gm.) three times a day beginning three weeks before the expected confinement, and he found only one patient who could not take the drug.

Journal of Experimental Medicine, New York

64: 1-160 (July 1) 1936

*Effect of Avitaminosis A on the Prostate. R. A. Moore, New York, and J. Mark.—p. 1.

Studies on Natural Immunity to Pneumococcus Type III: I. Capacity of Strains of Pneumococcus Type III to Grow at 41 C. and Their Virulence for Rabbits. J. F. Enders and M. F. Shaffer, Boston.—p. 7.

Effect of Purified Enzymes on Viruses and Gram-Negative Bacteria. M. H. Merrill, Princeton, N. J.—p. 19.

Chemo-Immunologic Studies on Conjugated Carbohydrate-Proteins: X. Immunologic Properties of an Artificial Antigen Containing Glucuronic Acid. W. F. Goebel, New York.—p. 29.

Air Driven Ultracentrifuge for Molecular Sedimentation. J. Biscoe, E. G. Pickels and R. W. G. Wyckoff, New York.—p. 39.

Immunization Experiments with Swine Influenza Virus. R. E. Shope, Princeton, N. J.—p. 47.

Serologic Reactions with Virus Causing Rabbit Papillomas Which Become Cancerous: I. Tests of Blood of Animals Carrying Papilloma. J. G. Kidd, J. W. Beard and P. Rous, New York.—p. 63.

Serologic Reactions with Virus Causing Rabbit Papillomas Which Become Cancerous: II. Tests of Blood of Animals Carrying Various Epithelial Tumors. J. G. Kidd, J. W. Beard and P. Rous, New York.—p. 79.

Changes in Bone Marrow and Blood Cells of Developing Rabbits. F. R. Sabin, F. R. Miller, K. C. Smithburn, R. M. Thomas and L. E. Hummel, New York.—p. 97.

Cultivation of Tissues for Prolonged Periods in Single Flasks. R. C. Parker, New York.—p. 121.

Fate of Virulent Hemolytic Streptococcus Injected into Skin of Normal and Immunized Rabbits. D. M. Angevine, New York.—p. 131.

Immunologic Specificity of Staphylococci: IV. Cutaneous Reactions to Type-Specific Carbohydrates. L. A. Julianelle and A. F. Hartmann, St. Louis.—p. 149.

Effect of Avitaminosis A on the Prostate.—In a study of the prostate in man, Moore and Mark observed five cases with metaplasia and inflammation, which resembled the effects of avitaminosis A. They investigated a series of rats on a deficient diet. Eight prepuberal and eight postpuberal white rats from the same colony were placed on a diet that was complete in all respects except for a deficiency of vitamin A. An additional four prepuberal and two postpuberal animals were fed the same diet and 2 drops of carotene in oil every three days. All animals were given 0.4 cc. of wheat germ oil by mouth or hypodermically every ten days. There was an excess of food in the cages at all times. The prepuberal animals were 30 days of age and the postpuberal 100 days of age at the start of the experiment. Animals were killed or died after from eighty-five to 115 days on the diet. The control animals were killed after 115 days and showed no pathologic changes. All experimental animals at death showed clinical xerophthalmia. Vitamin A deficiency alone in the white rat was associated with atrophy of the testis and accessory sexual glands. This would appear to be indicative of some disturbance in the hypophyseal-gonadal-prostatic hormone relationships. Vitamin A deficiency in the rat was found to be associated with foci of inflammation and epithelial metaplasia in the prostatic acini and vesicular ducts entirely similar to that reported in other organs. Focal metaplasia and inflammation is occasionally encountered in the prostate of patients with extreme inanition associated with stenosis of the esophagus. It seems probable that this lesion is due to vitamin A deficiency.

Journal of Infectious Diseases, Chicago

59: 1-128 (July-Aug.) 1936

Recoverability of Mycobacterium Tuberculosis-Avium from Experimentally Infected Guinea-Pigs. W. H. Feldman, Rochester, Minn.—p. 1.
Important Factor in Mechanism of Specific Bacterial Agglutination. C. R. Donham and C. P. Fitch, St. Paul.—p. 6.
*Effect of Mucin on Infections by Bacteria. W. J. Nungester, L. F. Jourdonais and A. A. Wolf, Chicago.—p. 11.
Mediums for Study of Diphtheria. Marie Koch McGuigan and M. Frobisher Jr., Baltimore.—p. 22.
*Precipitin and Complement Fixation Reactions of Polysaccharide Extracts of Brucella. Margaret Higginbotham and Lucy S. Heathman, Minneapolis.—p. 30.
Bactericidal and Biologic Properties of Phenylmercuric Subnitrate. K. T. Sasano and E. M. Medlar, Mount McGregor, N. Y.—p. 35.
Antigenic Characteristics of Related Organisms After Cultivation on Synthetic Medium. P. J. Beard and Jane E. Snow, Stanford University, Calif.—p. 40.
Recovery of Virulent Tubercle Bacilli from Tissues of Swine Intended for Food. W. H. Feldman, Rochester, Minn.—p. 43.
Vitamin B-Deficiency and Resistance to Toxin of Bacillus Welchii in Rats. S. B. Rose, W. B. Rose and J. A. Kolmer, Philadelphia.—p. 50.
Dietary Deficiencies and Resistance to Infection by Monilia. Lois Almon, S. B. Pessin and W. D. Stovall, Madison, Wis.—p. 54.
Relation of Herpes Antiviral Property of Human Blood to Sex, Pregnancy and Menstruation. N. P. Hudson, Enid A. Cook and F. L. Adair, Columbus, Ohio, and Chicago.—p. 60.
Relations Between Certain Heterophile Antibodies and Antigens. C. A. Stuart, M. Fulton, R. P. Ash and K. K. Gregory, Providence, R. I.—p. 65.
Cellular Reactions During Primary Infections and Superinfections of Plasmodium Brasilianum in Panamanian Monkeys. W. H. Taliaferro and P. R. Cannon, Chicago.—p. 72.
Complement Studies on Dogs During B-Avitaminosis and Anhydremia. S. B. Rose and J. A. Kolmer, Philadelphia.—p. 126.

Effect of Mucin on Infections.—Nungester and his associates point out that in 1932 they reported the observation that organisms suspended in gastric mucin and injected intraperitoneally into mice were more virulent than when inoculated in suspension in saline solution. The experimental work they report here deals with the effect of sterilized gastric mucin on the virulence of bacteria when injected into the host simultaneously with the organisms. They found that, when sterilized gastric mucin is used instead of saline solution as a menstruum for suspending various bacteria, the host is placed at a marked disadvantage and may succumb to what would otherwise be a sublethal infection. This effect has been noted when injections were made intraperitoneally, subcutaneously or intratracheally. The mechanism of the action is not yet understood. Mucin does not interfere with phagocytosis but does inhibit the bactericidal properties of phagocytic cells. It enables bacteria to survive in the body of the host for longer periods without diminution in numbers or it may allow the organisms to increase in numbers and so result in the death of the animal. The viscosity and cohesive properties of the mucin appear to be important indexes as to the effectiveness of mucin on bacterial infections. The authors think that their observations on the effect of mucin on the virulence of bacteria lie in two fields. First, it offers an additional method for studying infections in animals with organisms that normally do not infect the animal. Secondly, since mucin occurs in parts of the body that are prone to be the sites of infectious processes, as the respiratory tract, the intestinal tract and parts of the genital tract, one wonders whether or not the accumulation of excessive amounts of mucin in these sites under abnormal conditions might predispose such sites to infection.

Complement Fixation Reactions of Polysaccharide Extracts of Brucella.—Higginbotham and Heathman prepared polysaccharides from seven smooth Brucella strains, including varieties melitensis, abortus, suis and paramelitensis. The results of the precipitin tests employing rabbit antiserum for each of the seven strains and solutions of the polysaccharides from the seven strains and the results of the precipitin tests employing patients' serums and the polysaccharides are recorded in tables. In every instance the polysaccharide extract from a given strain precipitated its homologous antiserum. The authors reach the conclusion that the results of the precipitin tests with the polysaccharide preparations from seven strains of Brucella seem to show that organisms otherwise classified as of the same type may possess variable antigenic properties. The precipitin test is not a satisfactory one for establishing the type identity of a Brucella organism, although extracts from three of the seven strains were found to give a positive reaction only with the homologous type antiserum. The results support the contention that a polyvalent antigen including some local strains should be employed in the routine serologic examination for undulant fever. All the serums from cases of human brucellosis which showed agglutination with the stock antigens (Brucella melitensis, abortus and suis) gave positive precipitin reactions with one or more of the brucella polysaccharides. Although the series is small, the polysaccharide precipitin test would seem to have no advantage over the agglutination test as a routine procedure and has the disadvantage of being impracticable because of the time and cost involved in preparing extracts. The results of complement fixation tests with the Brucella polysaccharide extracts and specific antiserums, as well as those with the extracts and patients' serums, were not as clear cut as the precipitin reactions.

Journal of Urology, Baltimore

36: 99-188 (Aug.) 1936

Sarcoma of Kidney and Stone: Report of Case and Review of Literature. H. L. Kretschmer, Chicago.—p. 99.
Diagnosis of Spontaneous Rupture of Kidney Pelvis by Means of Intravenous Urography. J. W. Rogers, New York.—p. 105.
Crossed Renal Ectopia. M. M. Mayers, Los Angeles.—p. 111.
Actinomycosis of Kidney in Infancy and Childhood. H. L. Kretschmer and W. G. Hibbs, Chicago.—p. 123.
Cystic Dilatation of Lower End of Ureter, with Especial Reference to Transurethral Treatment with High Frequency Cutting Current: Report of Two Cases. J. A. Lazarus, New York.—p. 139.
Rhabdomyomyxosarcoma of Urinary Bladder. J. Welfeld, L. Hill and J. G. Hillebrand, Chicago.—p. 150.
Giant Prostatic Calculi: Report of Case. C. O. Ritch, Chicago.—p. 157.
Relation of Parathyroid Glands to Urinary Lithiasis. J. D. Barney and E. R. Mintz, Boston.—p. 159.
Urinary Lithiasis: Experimental Production and Solution with Clinical Application and End Results. C. C. Higgins, Cleveland.—p. 168.
Technic Used in Removal of Tissue from Bladder. E. Allen and N. J. Heckel, Chicago.—p. 178.
Straight Sound with Beak Tip for Dilating Prostatic Urethra. E. W. Hirsch, Chicago.—p. 180.
Three Miniature Cysto-Urethroscopes. M. F. Campbell, New York.—p. 183.

Kansas Medical Society Journal, Topeka

37: 309-352 (Aug.) 1936

*Diabetes Mellitus in Pregnancy. J. G. Stewart, Topeka.—p. 309.
Toxicity of Cinchophen: Clinical Study. G. A. Westfall, Halstead.—p. 311.
Osteomyelitis of Spine. M. E. Pusitz, A. K. Owen, G. A. Finney, J. L. Lattimore and M. Gerundo, Topeka.—p. 313.

Diabetes Mellitus in Pregnancy.—Stewart points out that the danger of pregnancy in diabetes was extreme before the discovery of insulin. The outlook today is far less serious and with proper treatment with a weighed diet and the proper amount of insulin a great many pregnancies can be carried to term without the extreme danger that existed before the use of insulin. Even with this improvement, however, the infant mortality rate according to certain authorities is 45.2 per cent. Consequently the situation is still very serious. The author thinks that, if the diabetic woman asks the physician whether it is safe to have a child, it is the physician's duty to tell the patient exactly what her chances are for herself and her baby. Diabetic patients are divided into three classes: (1) those with mild diabetes, who can be controlled on a diet alone without insulin; (2) those with moderately severe diabetes, who can be controlled on relatively moderate amounts of insulin; (3) those with severe diabetes, who take large amounts of insulin and who show periodic diacetic acid and acetone. It is known that as soon as pregnancy exists the amount of insulin has to be increased. It is also known that if there is any vomiting there will be a degree of acidosis; consequently the only safe rule to go by is to advise the patient with mild diabetes that the chances are fairly good; but even today patients with moderately severe and severe diabetes should be advised against planning to have children. If the diabetic woman finds that she is pregnant, the internist should analyze her case carefully. The woman should be hospitalized and put on a basal diet plus about 15 per cent, and with a proper amount of insulin to see whether a normal fasting blood sugar can be obtained and also whether there is any diacetic acid and acetone in the urine, as well as to see the amount of carbon dioxide. The author thinks that, if there is a high fasting blood sugar with a care-

fully weighed diet and fairly frequent suggestion of insulin shock when the insulin is given three times daily, also when diacetic acid and acetone are present and there is a somewhat diminished carbon dioxide, it is the internist's duty to refer the patient back to the obstetrician with the advice that a therapeutic abortion be performed to save the life of the patient. However, if there can be a good control of the blood sugar and there is very infrequent or no diacetic acid or acetone found in the urine after sufficient observation, the patient could go through a pregnancy and have a normal child. The author gives the history of a case which demonstrates what a serious problem pregnancy is in a woman with severe diabetes, the danger of anesthesia in severe diabetes and the increased severity of symptoms in diabetes complicated by infection of any kind.

Medical Annals of District of Columbia, Washington

5: 189-222 (July) 1936

Dependence of Modern Civilization on Health. W. A. White, Washington.—p. 189.
Clinical Observations on Glomerulonephritis. J. P. O'Hare, Boston.—p. 199.
Etiology of Rheumatoid (Atrophic) Arthritis. W. K. Myers, Washington.—p. 203.
Diabetic Gangrene Complicated by Welch Bacillus Infection: Report of Case. J. O. Warfield Jr., Washington.—p. 207.
Fundamentals of Internal Medicine: Diseases of Nervous System. A. Schneider, Washington.—p. 209.

Minnesota Medicine, St. Paul

19: 415-486 (July) 1936

Some Historical Notes on Treatment of Angina Pectoris. F. A. Willius, Rochester.—p. 415.
Treatment of Behavior Problems, Particularly Delinquency, in European Clinics Visited During Summer of 1935. H. S. Lippman, St. Paul.—p. 421.
The Social Aspects of Delinquency. G. R. Kamman, St. Paul.—p. 424.
Facts and Fancies Having Some Bearing on the Psychology of the Delinquent Child. F. Whitmore, St. Paul.—p. 429.
Report on Diagnosis and Treatment of Rheumatic Diseases in Europe. C. H. Slocumb, Rochester.—p. 436.
Lymphogranuloma Inguinale. J. F. Madden, St. Paul.—p. 441.
Death from Asthma. Olga S. Hansen, Minneapolis.—p. 445.
Visual Field Contractions After Head Injury. H. W. Grant, St. Paul.—p. 449.
Intussusception. B. F. Davis, Duluth.—p. 455.

Radiology, Syracuse, N. Y.

27: 1-130 (July) 1936

Distribution of Radiation Within Average Female Pelvis for Different Methods of Applying Radium to Cervix. A. N. Arneson, St. Louis.—p. 1.
X-Ray Aspects of Pneumoconiosis. L. H. Garland, San Francisco.—p. 21.
Treatment of Carcinoma of Breast by Extirpation of Tumor and Roentgen Irradiation: Preliminary Results. J. Borak, Vienna, Austria.—p. 33.
Eventration and Hernia of Diaphragm as an Incidental Finding. W. S. Newcomet and E. W. Spackman, Philadelphia.—p. 36.
Absorption of X-Rays by Lead Glasses and Lead Barium Glasses. G. Singer, Washington, D. C.—p. 44.
*Esophageal-Gastric Carcinoma Successfully Treated by Protracted Fractional X-Ray: Six Year Survival. S. M. Baum, New York.—p. 58.
Bilateral Osteochondritis Deformans Juvenilis Coxae: Case (Legg-Calvé-Perthes Disease). J. F. Elward and R. A. Bier, Washington, D. C.—p. 63.
*Effect of X-Ray on Fine Structure of Parenchyma of Thyroid Gland. (First Article). B. S. Zimnitsky, N. A. Baskina and A. P. Devirz, Svordlovsk, U. S. S. R.—p. 68.
Calcification of Brain Cortex Associated with Hemangioma of Face and Meninges. E. Lachmann, Oklahoma City.—p. 75.
Some Lawsuits I Have Met and Some of the Lessons to Be Learned from Them (Ninth Instalment). I. S. Trostler, Chicago.—p. 80.
Chronic Recurrent Intussusception in an Adult Associated with Adenocarcinoma of Cecum: Case Report. E. L. Shiflett, Louisville, Ky., and B. Kalayjian, Indianapolis.—p. 96.
Roentgenologic Study of Sacrococcygeal Chordoma. C. K. Hsieh and H. H. Hsieh, Peiping, China.—p. 101.

Esophageal-Gastric Carcinoma Treated by Roentgen Rays.—Baum reports the case of a man, aged 53, first seen in March 1929. He complained of difficulty in swallowing and of substernal pain of about one year's duration. About a year previously, the patient had had a hemorrhage from the stomach, vomiting a large amount of blood. Thereafter, because he began to notice progressive difficulty in swallowing, particularly solid foods, he was on a fluid diet. The patient lost about 10 pounds (4.5 Kg.) in the last three months, with considerable loss of strength. Roentgen examination of the gastrointestinal tract showed a marked dilatation of the lower end of the esophagus, and distal to this a tumor mass involving the esophagus and cardiac portion of the stomach. A piece of tissue was removed for microscopic study, which revealed a squamous-cell carcinoma with hornification. High voltage roentgen therapy, the protracted fractional method, was immediately instituted following the establishment of a definite diagnosis of squamous-cell carcinoma. It was felt that a gastrostomy was not indicated, as the patient was able to take liquid nourishment and retain it. The technical factors were 200 kilovolts, 4 milliamperes, 70 cm. distance. Filtration was through 2 mm. of copper and 1 mm. of aluminum. Large portals averaged 400 square centimeters. Daily treatments were given. Cross firing of the lower part of the esophagus and cardiac end of the stomach was done through upper abdominal and right and left oblique portals, each portal receiving about 5,000 roentgens. Forty-two treatments were given over a period of sixty-nine days, the average dose per treatment being 480 roentgens. Each portal was given the maximum skin toleration dose until an epidermitis resulted. Early in the course of treatment, which was effective from the beginning, the patient began to show improvement in swallowing. Soon after the completion of the treatment the patient was able to take all solid foods. He had no substernal pain or pain when swallowing. The roentgenologic examination at that time showed only a slight degree of irregularity at the cardiac end of the esophagus, corresponding to the site of the original lesion. The patient has been seen and examined in the follow-up clinic for the last six years. When seen on March 29, 1936, his weight was 170 pounds (77 Kg.), a gain of 26 pounds (13 Kg.) since treatment. The author thinks that the success in the treatment may be due to limited localized involvement, the relative ray sensitivity of the growth, and the fractioning of the dose and prolongation of the treatment.

Effect of Roentgen Rays on Parenchyma of Thyroid.—Zimnitsky and his associates made experiments on the thyroids of twenty male rabbits, aged from 6 to 8 months. Fifteen were treated with roentgen rays, five being used as controls. The technic consisted of a Koch and Sterzel apparatus and the Coolidge tube; distance, 24 cm.; filter, 3 mm. of aluminum; voltage, 140 kilovolts; 3 milliamperes; dose, 550 roentgens. The first lot of rabbits was irradiated three times, the second lot five times and the third lot ten times; the dose was given once a day. In order to study how time affected the development of the morphologic processes, rabbits were killed at twenty-four hours, six days, twelve days, twenty days or forty days after the treatment. For comparison, a control rabbit also was killed. The specimens of thyroid of both the treated and the control animals were fixed with Zenker's formaldehyde with the addition of acetic acid (Miloslavsky's method) and then were passed through a series of alcohol baths. They were then embedded in paraffin in the usual way. Sections of from five to six microns in thickness were stained with hematoxylin-eosin. The preparations made by this method served for a general survey of the gland conditions, but for fine cytologic examination the specimens were prepared by the Shampy method with a subsequent chromicizing, the paraffin section being from 2 to 3 microns in thickness. After removing the paraffin by treating the sections with hydrogen peroxide, the authors stained them for chondrioma, using Kull's method. On the basis of their observations they reach the following conclusions: 1. The parenchyma of the thyroid has a considerable resistance to roentgen rays. 2. The fine cytologic preparation of a thyroid reveals more fully and more quickly the initial steps of the changes taking place in the cells under the action of roentgen rays. 3. Changes in the cells of a thyroid involve the protoplasm as well as the nucleus and chondrioma. In the cell protoplasm there appear vacuoles of various sizes; the chondrioma becomes coarse and granular and loses its regular distribution in the cell body; the nucleus of such a cell undergoes pyknosis, and some of the affected cells finally disintegrate. 4. The action of the roentgen rays on the organ follows the so-called island principle. 5. In addition to the foregoing changes taking place in the individual cells of the thyroid, the chondrioma undergoes degenerative changes, that is, it becomes coarse and granular and loses its regular disposition in the cell body, while the nucleus and the protoplasm

of the cell keep their morphologically normal structure. 6. Colloid in the follicles of the irradiated thyroid becomes granular, undergoes vacuolization and decreases in quantity in the organ. 7. The structure of the thyroid regenerates when a lapse of time is permitted after irradiation.

Surgery, Gynecology and Obstetrics, Chicago

63: 1-128 (July) 1936

Acute Staphylococcus Osteomyelitis: Use of Staphylococcus Antitoxin as Aid to Management of Toxemia and Staphylococcemia. A. L. Joyner and D. T. Smith, Durham, N. C.—p. 1.
*Cyclical Changes in Human Vaginal Mucosa. H. F. Traut, P. W. Bloch and Alberta Kuder, New York.—p. 7.
Histologic Study in Twenty-Four Cases of Retained Testes in Adult. J. M. Pace and H. Cabot, Rochester, Minn.—p. 16.
*Prevention of Recurrent Renal Calculi. C. C. Higgins, Cleveland.—p. 23.
Study of Neosynephrin Hydrochloride in Treatment of Acute Shock from Trauma or Hemorrhage. C. A. Johnson, Chicago.—p. 35.
Analysis of Mortality of Gallbladder Surgery, with a Special Note on So-Called Liver Death; Based on 404 Consecutive Surgical Cases and 100 Consecutive Surgical Deaths in the New Orleans Charity Hospital. F. F. Boyce, J. R. Veal and Elizabeth M. McFetridge, New Orleans.—p. 43.
Treatment of Carcinoma of Esophagus. C. Eggers, New York.—p. 54.
Palliative Colostomy. D. P. MacGuire, New York.—p. 66.
Pole Ligation in Treatment of Hyperthyroidism. F. H. Lahey and L. J. Schwalm, Boston.—p. 69.
Double (Differential) Stethoscope: Aid in Determining Status of Individual Tubes During Performance of Rubin's Test. G. King, Shantung, China.—p. 76.
Urinary Obstructions in Infants and Children. J. R. Caulk, St. Louis.—p. 80.
Infra-Red Photographic Study of Changing Pattern of Superficial Veins in Case of Human Pregnancy. L. C. Massopust, Milwaukee.—p. 86.
Surgical Treatment of Acute Pancreatitis. D. deKlimkó, Budapest, Hungary.—p. 89.
Gastrojejunostomy Preoperative Decompression. R. W. McNealy and M. E. Lichtenstein, Chicago.—p. 96.
Observations on Lymphogranuloma Venereum: Clinical Pathologic Study of Sixty Cases, with Observations on Histopathology of the Frei Test. B. A. Kornblith, New York.—p. 99.
Abortion: Statistical Analysis of 2,287 Cases. C. H. Peckham, Baltimore.—p. 109.

Cyclic Changes in Vaginal Mucosa.—In the histologic variations of the human vaginal mucosa, Traut and his associates found that there is a definite rhythm which it is possible to correlate with menstruation and hence with the ovarian cycle. This cellular response is characterized by proliferation on the part of the stratum germinativum, with increase in the number of young epithelial cells in the basophilic zone of the epithelium. This response is associated with occasional mitoses and definite leukocytosis and hyperemia. The proliferative phase appears in the premenstruum, lasts six or seven days and is either completed premenstrually or extends into the menstrual phase and occasionally into the postmenstruum. It has not been observed between the seventh and twenty-first days of the cycle. Between the proliferative phases the epithelium is quiescent. Such alternation between proliferative and inactive phases has not been demonstrable in pregnancy, which seems to indicate that the rhythm of the vagina is related to the ovarian cycle. Changes in the superficial and intra-epithelial layers of the vaginal mucosa could not be correlated with the menstrual cycle. According to the observations they are quite arrhythmic.

Prevention of Recurrent Renal Calculi.—Higgins believes that the recurrence of calculi can be minimized by adherence to a properly planned diet and the addition of vitamin A in cases in which surgery has been employed. He has followed this plan for four years. Determination of the chemical constituents of the calculus and the type of crystals and sediment present in the urine is of value. The exact hydrogen ion concentration of the urine from the kidney which harbored the calculus must be determined in order that a correct diet may be instituted. In cases in which the calculus is composed of calcium and magnesium phosphates, carbonate or oxalates, the high vitamin A acid ash diet is employed in a routine manner. Calculi composed of the calcium, magnesium phosphate, and carbonate form in alkaline urine, and calcium oxalate may be precipitated in quite a wide range of urinary reactions. In these cases the acid-ash diet shifts the reaction of the urine strongly to the acid side. As a general rule an excess acid-ash of from 20 to 30 cc. is necessary to maintain the hydrogen ion concentration of the urine at a point from 5 to 5.2. In some instances, additional oral medication is required to maintain this level. Ammonium chloride, 0.5 Gm., in enteric coated pills is the most efficacious drug for this purpose and causes less gastro-intestinal symptoms than other acidifying agents. When a calculus is formed in alkaline urine and when the postoperative reaction is shifted to the acid side, check of the urine for uric acid and oxalate crystals or urates is necessary to prevent the recurrence of calculi. This can be accomplished by altering the diet so that the hydrogen ion concentration of the urine is changed to the point at which urates and uric acid and oxalate crystals do not appear in the urine. While in the hospital, the patient is taught to make his own hydrogen ion concentration determinations. These determinations are made half an hour before lunch to avoid the effects of the alkaline tide or of awakening respiration changes. The hydrogen ion determination reports are presented regularly to the family physician, who then can maintain the hydrogen ion concentration of the urine at the desired level by further adjustment of the diet or by altering the medication. In the author's experience, recurrent calculi are composed most frequently of calcium and magnesium phosphates (many also contain carbonates). Such calculi develop in an alkaline urine, and their recurrence can be minimized by the use of the high vitamin A acid ash diet, which shifts the reaction of the urine strongly to the acid side. Other therapeutic procedures which have been used in the past are employed also. While the patient is in the hospital, the dietitian instructs him daily concerning the diet, explaining why certain foods are allowed and others restricted. The mere listing and prescribing of acid or alkaline ash foods does not suffice—a careful, scientific approach is necessary to determine the percentage of acid or alkaline ash in the diet which is required to maintain the proper hydrogen ion concentration level in each individual case. The incidence of recurrent calculi can be reduced to a minimum by the close cooperation between the patient and the physician. Since the author has prescribed the use of a regulated diet high in vitamin A following the operative removal of renal calculi, in addition to the other therapeutic measures usually employed, he has reduced the incidence of recurrences from 16.4 to 4.7 per cent in his cases. In many cases, eradication of the infection has been observed after the patient has been on the high vitamin A acid or alkaline ash diet for a period of from two to three months.

United States Naval Med. Bulletin, Washington, D. C.

34: 285-430 (July) 1936

Review of Pathology Observed in 1,018 Postmortem Examinations in Haiti. J. H. Chambers.—p. 285.
Etiology and Management of Nephrolithiasis. A. J. Desautels.—p. 296.
Paroxysmal Hemoglobinuria: Report of Case Followed for Thirteen Years. J. G. Dickson.—p. 300.
The Civilian Conservation Corps: Résumé of Tour of Duty. R. A. Bell.—p. 306.
Surface Decompression of Divers. J. A. Hawkins and C. W. Shilling.—p. 311.
Duodenal Ulcer. J. F. Finnegan.—p. 317.
Errors in Six Consecutive Cases of "Appendicitis." W. H. Michael.—p. 329.
Influenza Lymphatica: Pentatype of Influenza. R. A. Nolan.—p. 332.
Acromioclavicular Dislocation. R. A. Benson.—p. 341.
Endometriosis. A. T. Walker.—p. 342.
Treatment of Lung Abscess. H. L. Puckett.—p. 347.
Relative Protective Value of Various Prophylactic Drugs and Methods for Control of Venereal Diseases. R. C. Boyden.—p. 354.
Method Used in Treatment of Thirty-Three Cases of Acute Gonococcus Urethritis Without Sick Days. R. A. Vilar.—p. 359.
Polymastia, with Especial Reference to Supernumerary Axillary Breasts: Brief Review with Case Report. C. F. Storey.—p. 362.
Short Wave Radiotherapy in Vincent's Infection. C. E. Allen.—p. 376.

West Virginia Medical Journal, Charleston

32: 345-392 (Aug.) 1936

X-Ray Therapy in Bronchitis in Children. R. C. Bond and C. H. Clovis, Wheeling.—p. 345.
Bronchiectasis: Discussion of General Bronchiectasis and Bronchiectasis as It Occurs in Pulmonary Tuberculosis. G. D. Morse and G. C. Shinn, Hopemont.—p. 351.
Elliott Treatment in Pelvic Infections. A. M. Dearman, Parkersburg.—p. 358.
Surgical Aids in Medical Vascular Conditions. C. M. Caravati, Richmond, Va.—p. 360.
Heliotherapy in Treatment of Tuberculosis. C. L. Hyde, Akron, Ohio.—p. 366.
Founders' Monument Address. T. M. Hood, Clarksburg.—p. 370.
The Sterile Couple. A. P. Hudgins, Charleston.—p. 372.
The Doctor as a Musician. E. Podolsky, Brooklyn.—p. 380.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

11: 97-170 (June) 1936

Encephalography in Investigation of Certain Cerebral Conditions in Childhood. Staff of Royal Aberdeen Hospital.—p. 97.
*Therapeutic Value of Vitamins A and D in Measles. Helen M. M. Mackay, Hilda M. Linford, M. Mitman and Mary H. Wild.—p. 127.
Reading Difficulties in Children. Mildred Creak.—p. 143.
Use of Avertin for Production of Basal Narcosis in Children. H. K. Ashworth.—p. 157.

Value of Vitamins A and D in Measles.—Mackay and her associates investigated the effect of giving vitamin D and vitamins D and A to children under 13 years of age with measles. The 697 cases were divided into three groups. The first group served as controls and had only the ordinary ward diet, the second group received in addition 3,000 international units of vitamin D daily and the third received the same amount of vitamin D with vitamin A in addition equivalent to 6 drachms (22.5 cc.) of cod liver oil. Comparison shows that on admission the children were fairly evenly divided between the three groups as regards age, incidence of pneumonia and incidence of otorrhea. They were also evenly distributed as regards the wards in which they were treated and the medical officers under whose charge they came. A comparison of fatality rates, incidence of pneumonia, otorrhea, all complications and skin lesions developed in the hospital, as well as a comparison of duration of pyrexia or length of stay in the hospital, affords no evidence of any favorable effect exerted on the course of the disease by giving either vitamin D or vitamins D and A combined. It is pointed out that this negative result may be due to the fact that the time of observation (average under twenty days) may have been too short to demonstrate any effect from vitamin therapy, and that the treatment may have been started too late, since in 81 per cent of the cases treatment was not started until after the appearance of the rash, say till the fourth day or later in the disease.

British Journal of Children's Diseases, London

33: 85-164 (April-June) 1936

Appendicular Symptoms in Acute Infectious Diseases. G. W. Ronaldson.—p. 85.
Artificial Pneumothorax in Children: Record of Five Cases. C. Rolleston.—p. 93.
Note on So-Called "Congenital Varicose Veins." F. P. Weber.—p. 102.
Case of Asthma and Stammering in a Boy. M. Yearsley.—p. 106.

British Journal of Surgery, Bristol

24: 1-204 (July) 1936

Total Removal of Lung. R. M. Walker.—p. 7.
Hydatid Disease of Kidney. R. C. Begg.—p. 18.
Congenital Dislocation of Head of Radius. B. McFarland.—p. 41.
*Multiple Primary Epithelioma in Lymphatic Leukemia. R. J. V. Pulvertaft.—p. 50.
Acute Iliopsoas Abscess. R. E. Norrish.—p. 55.
Cleft Sternum: Case Report and Brief Commentary. G. A. M. Knight and G. H. Morley.—p. 60.
*Melanoma of Rectum. H. H. Lindner and W. Q. Wood.—p. 65.
Radical Excision of Malignant Tumors in Ethmoid-Maxillary Region. W. H. G. Jessop.—p. 76.
Spondylolisthesis. J. A. Jenkins.—p. 80.
Clinical Manifestations of Spread of Carcinoma of Esophagus Observed During Life. J. E. G. McGibbon.—p. 86.
Intravenous Injection of Hypertonic Sodium Chloride Solution in Treatment of Conditions of Low Blood Pressure. Joan B. Walker.—p. 105.
Observations on Surgery of Trigeminal Neuralgia. E. P. Stibbe.—p. 122.
Reconstruction of Common Bile Duct. J. H. Couch.—p. 130.
Continuous Intravenous Infusion. P. R. Allison.—p. 137.
Two Cases of Ganglions in Sheath of Peroneal Nerve. V. H. Ellis.—p. 141.
Cystic Disease in Supernumerary Breasts. A. J. Noronha.—p. 143.
Significance of Lumbosacral Transitional Vertebrae. G. A. G. Mitchell.—p. 147.
Three Cases of Fracture Resulting from Electric Shock. H. J. Burrows.—p. 159.
Osteochondritis Deformans Coxa Juvenilis or Perthes' Disease: Results of Treatment by Traction in Recumbency. A. L. Eyre-Brook.—p. 166.
*Observations on Experimental Production of Peptic Ulcer in Ileum. P. P. T. Wu and H. G. Thompson.—p. 183.

Multiple Primary Epithelioma in Lymphatic Leukemia.—Pulvertaft says that multiple primary carcinoma of the skin occurs in x-ray workers and in xeroderma pigmentosum and is particularly associated with those whose work, as in the case of sailors, leads to constant exposure to the elements. The case of a grave digger was unusual in that the cutaneous condition was in part carcinomatous and in part a complication of lymphatic leukemia. The author points out that lymphatic leukemia is usually considered a neoplastic disorder, and the association of two distinct malignant conditions, while of interest, is familiar enough. The chief point of note in this case is its bearing on the function of the lymphocyte in malignancy. Murphy, starting from the observation that there is consistently a lymphocytic infiltration at the growing edge of a malignant neoplasm, argued that the lymphocyte provided an important barrier to the spread of tumors. There is, however, evidence leading in the opposite direction. In cutaneous epithelioma invasion occurs only in tissues where lymphocytes are aggregated; and lymphatic glands are of all organs the most prone to secondary invasion. Leukemic deposits in the skin are of frequent occurrence and take many forms. The condition is fully described by Hirschfeld. In a long series of references no mention is made of the development of malignant changes in the superficial epithelium, and it has not been possible to find any instance of such a change. It seems probable, therefore, that the primary exciting factor for the epitheliomas was the long standing condition of xeroderma. In every case, however, the epitheliomas in fact developed in areas of leukemic infiltration, and this suggests that nutritional or other changes occasioned by their presence were the last straw for the already pathologic epithelium. It is remarkable that epithelioma consistently develops in areas affected by injuries of long standing, where subepithelial fibrosis is a feature; this is found in lupus, old burns and scars and syphilis. There may be a purely nutritional basis for this fact, and the leukemic infiltration may have precipitated in this case a malignant change in which a defective blood supply to the epithelium was one factor.

Melanoma of Rectum.—Lindner and Wood describe a case which they regard as a typical illustration of melanoma of the rectum. Clinically the symptoms are similar to those of adenocarcinoma of the rectum, and the condition will usually be mistaken for that lesion. Blackish discharge on the examining finger, however, might arouse suspicion as to the nature of the tumor. If the speculum is introduced, the dark color of the growth will suggest its nature. In some cases there has been pigmentation of the anal orifice, and this appearance has sometimes been confused with thrombotic external hemorrhoids. The tumor in the present case was sessile, but in 33 per cent (Loques) of the recorded cases it has been pedunculated and may even present at the anus as a polyp. A melanoma bulges into the lumen of the bowel; it shows no tendency to spread in an annular fashion, causing stenosis, as is frequently the case in adenocarcinoma. If it obstructs the bowel it does so by a process of occlusion and not of stenosis. It resembles in this respect a sarcoma of the rectum. The almost uniformly low position and the exceeding rarity of melanoma in other parts of the alimentary canal suggest that it probably arises from the skin of the anal canal. Chalier and Bonnet believed that they were able to trace the exact point of departure of the tumor from the malpighian epithelium of the anal canal. The authors were not able to do this in their specimen but observed that the tumor tissue came into the closest relationship to the squamous epithelium of the lower part of the anal canal. The evidence afforded by a study of melanoma of the rectum seems to favor the origin of this tumor from skin. Regarding the spread of the tumor, they say that regional lymph nodes which contain pigmented cells are not necessarily the seat of metastasis.

Experimental Production of Peptic Ulcer in Ileum.—Wu and Thompson point out that peptic ulcer in the ileum is almost always associated with the presence of a Meckel's diverticulum which contains heterotopic gastric mucosa in its wall. The object of this study was to reproduce the lesion experimentally and determine some of the factors concerned. Seven dogs were used for this study. The importance of acid as a factor in the development of peptic ulcer has been demonstrated. On the other hand, the presence of heterotopic gastric tissue in the ileum only occasionally leads to the development of peptic ulcer. While the difference in the outcome may depend on a qualitative or quantitative variation of the aberrant

gastric secretion or of the ileac contents, the theory of diathesis or individual susceptibility to the disease may also be invoked. That the alkaline ileac contents exert a protective or neutralizing influence against the acid gastric juice is shown by the development of peptic ulcer following the deviation of the intestinal current from the vicinity of the transposed stomach. The fact that ulcers are not invariably produced by such procedures calls for no explanation so long as there exists the possibility of regurgitation of intestinal contents into the side-tracked portion. Finally the development of ulceration in the ileum after the operation of surgical duodenal drainage to produce a jejunal ulcer had been added to the other two procedures is somewhat suggestive of a reflex nervous or hormone factor. Until secretory nerves to the islands of gastric tissue in a Meckel's diverticulum have been demonstrated, a hormone mechanism like that established by Ivy and Farrell in autogenous pouches of the fundic portion of the stomach transplanted subcutaneously in dogs appears to be more important from the clinical point of view. The observations made in this study seem to lend support to the hypothesis that the development of peptic ulcer in a Meckel's diverticulum containing heterotopic gastric mucosa depends on biologic, chemical and possibly reflex nervous or hormone factors.

Edinburgh Medical Journal

43: 417-480 (July) 1936

Diabetes Insipidus: Site of Formation of Antidiuretic Hormone. J. H. Biggart.—p. 417.
Clinical Recollections and Reflections: IV. Surgery in General Practice: Its Difficulties and Limitations. J. B. Simpson.—p. 426.
Harvey and Integration. W. J. Stuart.—p. 438.
Effect of Early Tonsillectomy on Incidence of Acute Rheumatism. H. L. Wallace and A. B. Smith.—p. 452.
Gallbladder in Animals. C. F. W. Illingworth.—p. 458.

Glasgow Medical Journal

8: 1-48 (July) 1936

Importance of Nasal Sinusitis in General Practice. J. Harper.—p. 1.
*Smooth Muscle Tumors of Kidney: Report of Case and Review of Literature. J. F. Heggie and S. Alstead.—p. 17.

Smooth Muscle Tumors of Kidney.—Heggie and Alstead say that, while small mesodermal tumors of the kidney are not uncommon, fibroma, lipoma, leiomyoma and so on, larger forms of these growths are relatively rare. Smooth muscle tumors of the kidney are of two kinds: small, often multiple, growths from 2 to 9 mm. in diameter, not uncommonly found beneath the kidney capsule or in the superficial cortex—incidental post-mortem observations—and the rare large solitary growths of like character arising, possibly from displaced elements of the primitive myotome, in muscle fibers of the capsular tissues or of the walls of the renal pelvis or vessels of the cortex. As a rule, the latter tumors are of slow growth and may be present for many years, the patient being aware merely of a swelling and a variable amount of discomfort or minor degrees of pain in the affected side. Dysuria and frequency of micturition are occasionally complained of. The authors relate the clinical history of a woman, aged 40, in whom roentgenoscopy disclosed a tumor above the colon and not attached to the bowel. On operation a large retroperitoneal tumor was seen on the right side of the abdomen. The upper pole of the right kidney was attached to the inferior aspect of the tumor, and the kidney as a whole was so much displaced in a downward direction that its lower pole was on a level with the brim of the true pelvis. There was no definite indication as to the nature of the neoplasm and it was not considered justifiable to incise it in case it turned out to be malignant. Accordingly the ureter was ligated and divided and the tumor with the attached kidney and suprarenal gland was removed. The patient made an uninterrupted recovery and is now quite well. The histologic examination of the specimen revealed no evidence of rapid growth or of malignancy. In discussing this case of simple fibroleiomyoma of the kidney, the authors say that it might be argued that in this case the kidney need not have been sacrificed and that the tumor might well have been removed with the attached portion of the renal capsule. It should be remembered, however, that at operation the exact nature of the tumor and its origin could not be decided, and, as the tumor might well have been malignant, excision of tumor and kidney was justifiable. It is probable that this tumor grew slowly from a small tumor of the variety "quite common, though always of minute size, beneath the capsule of the kidney," but its exact origin in this instance of advanced growth cannot be definitely stated.

Irish Journal of Medical Science, Dublin

No. 126: 241-288 (June) 1936

Future Hospital Policy in Dublin. H. Moore, R. J. Rowlette, W. Doolin, J. A. Harbison, T. G. Moorhead, W. C. Dwyer, J. J. McCann, A. A. McConnell and R. A. Stoney.—p. 241.
X-Ray Cinematography. R. Reynolds.—p. 267.
*Peripheral Nerve Injury Due to Pressure. H. L. Parker.—p. 272.
Endometrioma and Other Similar Abnormalities. J. T. Wigham.—p. 279.

Peripheral Nerve Injury Due to Pressure.—Parker directs attention to three clinical criteria in the diagnosis of peripheral nerve injury due to pressure: (1) Both paralysis and anesthesia, collectively or separately, appear insidiously and may progress to complete nerve destruction; (2) the patient himself is the sole cause of the damage, and (3) he has no knowledge at the time or thereafter of the damage that he is doing. The first case illustrating this is one wherein the patient's own tissues provided the trauma. A woman, aged 23, came for treatment because of weakness of her left hand. Twelve months before, while milking cows, she had noticed a gradual loss of strength in extension of the fingers of her left hand, starting with the little finger and spreading gradually radiad to include by turn the middle and index fingers and thumb. There was atrophy of the extensor muscles of the fingers, and a corresponding groove could be found in the forearm. The extensor muscle of the thumb also was paralyzed. Palpation over the neck of the radius revealed a thickened nodular cord assumed to be the dorsal interosseus nerve. The diagnosis of paralysis of this nerve was made. The author points out that Learmonth and Woltman developed the hypothesis that compression of the nerve occurs between the aponeurosis of the common extensor and the supinator brevis. Accordingly they made an exploration and found that the nerve had made a groove for itself across the fibers of the supinator brevis. There is another clinical phenomenon wherein the abnormality of physical constriction is a likely cause of damage to a nerve. In this connection the author reports the case of a man with meralgia paraesthetica. This disorder is due to long continued compression of the lateral cutaneous nerve of the thigh. The author shows that the erect posture has a definite influence in causing meralgia paraesthetica but that there are other postural influences on nerves in connection with the lower extremities. As an example, there is the bilateral paralysis of the muscles supplied by the common peroneal nerve appearing in workers, such as beet planters and coal pickers, who are forced to assume a squatting position for hours on end. The obvious cause in this instance is compression of the nerve by the hardened and contracted hamstring muscles. Further, the author shows that the habit of crossing the knees may be a factor in damage to the peroneal nerve. Moreover, unilateral ulnar paralysis is not uncommon in patients convalescing from surgical operations.

Journal of Laryngology and Otology, London

51: 425-498 (July) 1936

Indications for Labyrinth Operation, with Especial Reference to Acute Diffuse Destructive Labyrinthitis. R. Lund.—p. 425.
Importance of Otomicroscopy in Diagnosis and Treatment of So-Called Secretory Middle-Ear Catarrh. E. Lüscher.—p. 454.

Journal of Mental Science, London

82: 203-290 (May) 1936

Artificial Psychoses Produced by Mescaline. E. Guttmann.—p. 203.
Problem of General as Against Focal Symptoms in Cerebral Lesions: Contribution to General Symptomatology. W. Mayer-Gross and E. Guttmann.—p. 222.
Some Observations on Renal Function in Mental Disorder. B. H. Shaw.—p. 242.
*Investigations on Problem of Immunity Against Spirochaeta Pallida in General Paralytics Treated with Malaria. A. Beck.—p. 254.

Immunity Against Spirochaeta Pallida in Patients with Dementia Paralytica.—Beck says that the improvement of dementia paralytica by treatment with malaria is known to be accompanied by the disappearance of the spirochetes from the brain. As further elucidation of the immunity problem in

dementia paralytica seemed desirable, experiments were undertaken for that purpose. No evidence was found of an antibody enhancing the phagocytosis of Spirochaeta pallida. The mechanism leading to the improvement of dementia paralytica is not of humoral but of cellular nature.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

43: 393-608 (June) 1936

Unavoidable Hemorrhage. C. Berkeley.—p. 393.
Upper Urinary Tract in Pregnancy and Puerperium, with Especial Reference to Pyelitis of Pregnancy. D. Baird.—p. 435.
Clinical and Pathologic Study of Salpingo-Oophoritis Due to Pyogenic Infection. A. McLellan.—p. 460.
Tuberculosis of Cervix Uteri, with Description of an Original Case. F. H. Finlaison.—p. 473.
*Grafting of Endometrium from Uterus of One Woman Into Uterus of Another, Combined with Grafting of Ovary. B. Solomons.—p. 487.
Modern Theories of Dysmenorrhea. D. J. Cannon.—p. 492.
Interlocked Twins Treated by Cesarean Section. J. B. Dawson.—p. 507.

Grafting of Endometrium and of Ovary.—Solomons reports the case of a married woman, aged 28, who gave a history of ovaritis as a complication of mumps and a gynecologic operation in 1930 when an ovarian cyst with the ovary was removed. She was in a highly neurotic condition, had not menstruated for three years and had lost all feeling of sex. Examination at the time (August 1933) revealed a normal pelvis. She was admitted to the hospital, and numerous endocrine products were injected without the desired effect, i. e., to bring about menstruation. July 21, 1935, the abdomen was opened. A very small uterus was found. The ovary had apparently been removed on the left side, and the ovary on the right side was slightly cystic and adherent to the broad ligament. The uterus was then split and the endometrium exposed. It was very atrophic in appearance. A piece of endometrium was dissected from a uterus removed for multiple fibroids from a woman of 34 immediately prior to the operation and was grafted into the uterus of the patient by means of fine interrupted catgut sutures. In addition a piece of ovary which was attached to the removed uterus was placed in the right rectus muscle. September 25, two months after the operation, the first menstruation ensued, lasted three days and has been regular since.

Journal of Tropical Medicine and Hygiene, London

39: 149-160 (July 1) 1936

Malaria in Portugal. J. N. Dugdale.—p. 149.
Destruction of Bilharzia Parasites of Man. F. G. Cawston.—p. 150.

39: 161-172 (July 15) 1936

Schistosomiasis Japonica: Account of Outbreak. J. T. Spiridion.—p. 161.
Arteriosclerosis and Arcus Senilis in Young Negro Male. R. H. Kampmeier.—p. 164.

Lancet, London

1: 1451-1508 (June 27) 1936

The Present Concept of Focal Infection. W. P. Murphy.—p. 1451.
*Treatment of Staphylococcic Skin Lesions with Toxoid. L. E. H. Whitby.—p. 1454.
*Oral and Parenteral Administration of Prostigmine and Its Analogues in Myasthenia Gravis. L. P. E. Laurent and Mary B. Walker.—p. 1457.
Further Observations on Gold Treatment of Rheumatoid Arthritis. S. J. Hartfall and H. G. Garland.—p. 1459.
The "Accidents" of Gold Treatment in Rheumatoid Arthritis. G. J. V. Crosby.—p. 1463.
The Cardiac Outline. T. S. Keith.—p. 1466.
Some Experiences in Gallstone Surgery. E. R. Flint.—p. 1469.
Prevention of Disease by Diet. A. G. Morison, S. Datta and A. F. Waters.—p. 1472.
Congenital Urethral Obstruction. Anne E. Somerford.—p. 1473.
Position of Ureters in Case of Procidentia. J. L. Jona.—p. 1473.
Subphrenic Abscess. W. Broadbent.—p. 1474.

Treatment of Staphylococcic Skin Lesions with Toxoid.—Whitby determined the amount of circulating antihemolysin in 100 normal persons, in 200 cases of superficial lesions (carbuncles, boils, styes, sycosis and pustular acne) before and after treatment, and in seventeen cases of deep-seated lesions (osteomyelitis). It would appear that the distribution of antihemolysin is the same in normal individuals as in those affected with superficial lesions. But the antibody is often definitely increased in deep-seated lesions—a useful diagnostic point in obscure disorders of bone. The distribution of antihemolysin in normal individuals is approximately the same as that found by Parish, O'Meara and Clark. Titrations were carried out by the method described by these workers. In the 200 cases all the results followed on immunization with a total dose of 0.75 cc. of toxoid administered intramuscularly. The total dose was distributed in four doses of 0.05, 0.1, 0.2 and 0.4 cc. at intervals of one week. The 135 patients who recovered have been free from relapse for periods varying from two to fifteen months. All lesions were proved by culture to be staphylococcic in origin. The most striking effects have been obtained with boils, styes and carbuncles. With regard to carbuncles, the majority have also been incised but are regarded as successes for toxoid in view of the speed of healing. In the small series of pustular acne and sycosis (seventeen cases) the toxoid did not appear to be more effective than vaccine. Only two patients with pustular acne recovered. Forman found toxoid of little or no use for the treatment of sycosis, but Connor has reported success in this disease after a long course of treatment. Thirty-seven patients exhibited temporary exacerbations during treatment. Of these, twenty-nine made rapid recovery within a few weeks of the fourth injection. Twenty-nine patients with boils recovered or improved with the dose adopted but subsequently relapsed after intervals varying from a few weeks to a few months. A second course has in most cases again procured relief, but to ensure complete freedom from infection most have had to attend for a monthly dose of 0.2 cc. of toxoid. Others have had subsequent successful treatment with a combination of toxoid and autogenous vaccine. Complete failure was experienced in twelve cases of boils. Seven of these patients were primarily bad subjects by reason of occupation or local skin disease, but five appeared to have a normal skin.

Administration of Physostigmine Derivative and Its Analogues in Myasthenia Gravis.—Laurent and Walker have had eight patients with myasthenia gravis under care, who have taken dimethylcarbamic ester of hydroxy phenyl-trimethyl ammonium methyl sulfite, the physostigmine derivative, for more than a year. Working independently they have had the opportunity of using analogous drugs by injection and by mouth. The results which they have obtained by the latter method are particularly encouraging, and they believe that adequate relief will be experienced from oral therapy in many mild cases, while fewer injections will be required in the more severe cases. Apart from drugs of this group, some of their patients have taken ephedrine and others have taken potassium chloride in large doses daily. Much larger doses of the drug are required if the oral method of therapy is employed. From 25 to 30 mg. gave a result comparable in intensity and in duration with the result seen after an injection of 0.5 mg. During the past few months the authors have received supplies of an analogous drug, methyl-phenylcarbamic ester of 3-oxyphenyl-trimethyl-ammonium-methyl-sulfate. This drug has now been used by them orally in gradually increasing doses with success. They found that 10 mg. gave a demonstrable though weak result. The doses were gradually increased up to 90 mg., which gave rise to no pain or unpleasant side action. The oral method of treatment obviates the necessity for injections, gives a more prolonged action, and it would probably be possible by giving two or three doses to keep the patient at her best for the full twenty-four hours. The longer action should prove particularly useful in severe cases in which dyspneic attacks are liable to occur at night after the effect of an injection has worn off. Dimethylcarbamic ester of 8-oxymethyl-quinolinium-methyl-sulfate has an action nearly as intense as that of the first drug, but the duration is much shorter. Of the eight patients studied, five are somewhat better than a year ago and have suffered no relapses, two have had relapses from which they have recovered although the physostigmine derivative was continued throughout, and finally one patient died. The last had a very long history with previous attacks of dyspnea before treatment began. She had two similar relapses after taking the physostigmine derivative and died in the latter of these while she was no longer under the influence of the drug. The treatment appears to have no direct effect on the ultimate course of the myasthenia, but at the same time

it brings about improvement in the general health of the patients, as they are able to eat more adequate meals and to lead a more varied life.

2: 1-58 (July 4) 1936

Industrial Pulmonary Disease Due to Inhalation of Dust, with Especial Reference to Silicosis. E. L. Middleton.—p. 1.
*Inhibition and Induction of Uterine Bleeding by Means of Estrone. S. Zuckerman.—p. 9.
Pustular Psoriasis: Review of Thirty-Two Cases. J. T. Ingram.—p. 13.
Right and Left Ventricular Failure: Study of Circulation Time and Venous Blood Pressure. P. Wood.—p. 15.
Trichomonas Vaginitis: Its Incidence and Coexistence with Gonococcic Infections. A. J. King, W. N. Mascall and I. N. O. Price.—p. 18.

Uterine Bleeding and Estrogenic Substance.—Zuckerman confirms by two experiments the fact that bleeding occurs during continuous theelin injections only when the amount given daily is a threshold or subthreshold dose. One monkey has never bled in the course of 220 days during which it has been given 1,000 international units of theelin daily; another, on 100 international units of theelin daily, bled between the forty-eighth and fifty-second day of a course of injections which has thus far lasted eighty-nine days. In the light of these facts and in view of the accepted relationship between rat and international units, it is plain that a reasonable interpretation of Hisaw's two experiments is that his monkeys were being injected with threshold doses of theelin. It thus appears that the data which have been widely interpreted as showing that uterine bleeding is stimulated as a direct effect of the hormone during the course of theelin injections are insufficient to justify this conclusion. On the contrary, most of the available facts are amenable to interpretation in terms of the established observation that uterine bleeding occurs only when the level of theelin falls below a threshold value. There can be little doubt that the present acceptance of the view that theelin during its administration normally and actively stimulates uterine bleeding is unjustifiable, and that, when it is used as a step in argument, it can only help to lead to hypotheses of the nature of the menstrual cycle (e. g., Robson and Henderson) that do not agree with the facts about the cycle derived from the experimental study of primates. The available evidence does not suggest that estrogenic substance actively stimulates uterine bleeding but still favors the view that bleeding is an event which marks the cessation of the hormone's action.

Medical Journal of Australia, Sydney

1: 835-866 (June 20) 1936

Modern Outlook on Nutrition. N. M. Gutteridge.—p. 835.
*Treatment of Circulatory Failure. H. W. Wunderly.—p. 840.
Surgical Aspects of Goiter Problem. H. R. G. Poate.—p. 842.
*Ratio of Large to Small Lymphocytes in Persons Exposed to Lead Hazard. D. O. Shiels.—p. 847.
Cerebral Arteriography. L. C. E. Lindon.—p. 849.

Treatment of Circulatory Failure.—Wunderly says that it is convenient to divide the whole cardiovascular system into central and peripheral parts when considering the treatment of circulatory failure. Clinically, it is essential to know whether one is faced with a condition of central or heart failure or of peripheral failure. Central failure is usually accompanied by increased blood volume, peripheral failure by diminished blood volume. Following the classification of Wollheim, cardiac failure was divided into plus decompensation, which is characterized by dyspnea, orthopnea, cyanosis of the lips and the acral parts and increased venous pressure; and minus decompensation, in which there is low blood volume, no dyspnea on lying down, patchy skin cyanosis and low venous pressure. The acute cases of minus decompensation correspond to circulatory failure in the severe infections. Minus decompensation is a peripheral circulatory failure, not a failure of the heart itself. In it four conditions are found: (*a*) decreased blood volume and insufficient venous return flow, (*b*) concentration of the blood, (*c*) decreased blood chlorides and (*d*) low venous pressure. The treatment of peripheral circulatory failure is the treatment of these four conditions. The most satisfactory method of increasing blood volume is by introducing fluids intravenously. These should be administered at the rate of 2 or 3 cc. per minute, and large quantities are usually necessary. Blood is the best fluid; 6 per cent acacia solution is useful if the hemoglobin is not below 25 per cent, and up to three or four liters a day should be given. The cause of the hyperpyrexial reaction is discussed and methods of preparation of solutions and apparatus are mentioned. The drugs that are recommended to increase blood volume are strychnine, camphor, caffeine, epinephrine and solution of posterior pituitary.

Lymphocytes in Persons Exposed to Lead.—Shiels points out that it has usually been accepted that the examination of white blood cells gives little information of value with respect to lead poisoning but that in a recent highly suggestive and interesting paper by Annie E. Ferguson and Thomas Ferguson it has been shown that the ratio of large mononuclear lymphoid cells to small lymphocytes has a closer relationship to the clinical condition than the stippled cell count, which has so far been regarded by most authorities on lead poisoning as of prime importance. Stippled cell counts depend to a considerable extent on the type of stain used, the technic of staining and the visual acuity of the observer, whereas the determination of the ratio of large to small lymphocytes is much less dependent on personal factors or on technic. The Fergusons pointed out that the precise differentiation between monocytes and large lymphocytes may be difficult, and they therefore included both types in the classification of large mononuclear lymphoid cells. The author did the same in the present investigation. He found that absorption of lead causes an increase in the ratio of large lymphocytes and monocytes to small lymphocytes. A fall in this ratio below 2:1 while the subject is exposed to the hazard is associated with definite symptoms of lead poisoning, usually of sufficiently severe nature to cause incapacity. Generally speaking, the more severe the case, the lower the ratio. The magnitude of this ratio is more closely associated with the clinical condition than is the stippled cell count and it is a simple and useful indication by which to judge of the imminence or otherwise of lead poisoning and is an aid to diagnosis.

Tubercle, London

17: 433-480 (July) 1936

Critical Review of Dispensary Organization in France, with Especial Reference to Administrative County of the Seine. R. H. Hazemann.—p. 433.
*Diagnosis of Cavities in Pulmonary Tuberculosis by Means of Tomograph. J. B. McDougall.—p. 452.
Congenital Heart Disease and Pulmonary Tuberculosis. S. R. Gloyne.—p. 455.

Diagnosis of Cavities in Pulmonary Tuberculosis by Means of Tomograph.—McDougall asserts that tomography presents a further advance on all previous roentgen technic and that it is of special interest in defining cavities that may be obscured from direct vision in the usual anteroposterior films, which form the great majority of all pictures taken in chest clinics. The tomograph can take actual sections of the chest at any level, although for ordinary purposes three sections (ventral, dorsal and medial) are sufficient as a rule. The fact that the rib shadows are almost eliminated from the sections is of great importance; the sternum and the vertebral column are not shown as bony structures at all, although in dorsal sections the outer ends of the ribs and the outline of the vertebral column may appear. This unusual result is obtained by a simple but ingenious device that allows the tube and the film holder to move in contrary directions during the exposure, which is normally of one second. The secret of the success of the tomograph mechanism lies in the fact that the tube and film describe an arc of about 45 degrees during the exposure; this ensures that all objects in the plane of the chest which is being photographed are reproduced on the film, and that all objects lying outside this plane are projected away from the film. The arc can be lessened and in this way it is possible to obtain sections from some 3 mm. thickness up to sections about 3 cm. in thickness. If it is decided to take a picture through the entire thickness of the chest, the tube and film are kept stationary and one gets the usual anteroposterior picture without any elimination of the bony thorax. In a case of advanced tuberculosis with tubercle bacilli in the sputum, the usual anteroposterior film shows a large cavity in the left upper lobe with two stout fibrous strands traversing the lower part of the cavity, but a ventral tomograph shows that the space in the left upper lobe is clear and that it ascends to the extreme apex. The medial tomograph shows what appears to be the origin of the fibrous bands seen in the anteroposterior film and there is still no evidence of a cavity wall in the left upper lobe. The space is, in fact, particularly

clear and gives the impression that it is not a pulmonary cavity but a localized pneumothorax, and that the dense shadow on the inner side is collapsed lung. On the right side of the medial picture, however, there is a veritable chain of cavities that are not in the anteroposterior picture. In the dorsal tomograph section the undoubted nature of the fibrous bands is made clear, for they are actually thick adhesions coming from the collapsed lung to the chest wall. On the right side of this section there is a large cavity with a dense upper wall.

Archives de Médecine des Enfants, Paris

39: 393-504 (July) 1936

Histophysiologic Mechanisms of Hypophysis. A. Policard.—p. 393.
Hypophysis and Prepuberty. G. Mouriquand.—p. 407.
*Diabetes Insipidus and Hypophysis in Children. P. Lereboullet and J. Bernard.—p. 421.
Technic of Hypophyseal Opotherapy in Children. P. Lereboullet.—p. 442.
Tumors of Hypophysis. Mme. J. Roudinesco.—p. 450.
Therapeutic Indications of Tumors of Hypophysis. P. Puech and L. Stuhl.—p. 461.

Diabetes Insipidus and the Hypophysis in Children.—Without discussing in great detail the problem of diabetes insipidus and the hypophysis, Lereboullet and Bernard merely report several observations of diabetes insipidus in children and from these observations attempt to draw certain pathogenic, clinical and therapeutic conclusions. In one case a typical diabetes insipidus developed during three years in a young boy without any accompanying sign of hypophyseal disorder being noted. The dechloridizing regimen and especially the administration of hypophyseal extract were effective, but only briefly, since it was necessary to repeat the injections four times daily. Even thus it was not always possible to suppress completely the abnormal polyuria. Hypophyseal medication subcutaneously seemed to be the only satisfactory method of treatment and was almost specific in its character. Observations of the disease in two other children gave similar results. They believe it possible to conclude therefore that diabetes insipidus in a child is most commonly apparent as a pure syndrome characterized especially by polyuria, polydypsia and some accessory cutaneous disorders, and resulting in a loss of weight which can develop into a true cachexia. In the majority of cases, objective signs of the hypophyseal lesion cannot be found. Complete integrity of the eyes, of the sella turcica and of the cerebrospinal fluid is found repeatedly. It is indicated, nevertheless, according to the authors, that the long continued administration of posterior hypophyseal extract to infants afflicted with diabetes insipidus carries with it the same therapeutic specific effectiveness that insulin does for diabetes mellitus.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

52: 1107-1149 (July 6) 1936. Partial Index

Nicholas-Favre Disease and Erythema Nodosum. P. Carnot, R. Cachera and Mallarmé.—p. 1108.
*Rheumatic Erythema. H. Grenet.—p. 1117.
Painful Knee. H. Dufour and Bréchot.—p. 1122.
So-Called Step-like Pleurisies. Dumitresco-Mante and Ciorapciu.—p. 1130.

Rheumatic Erythema.—Grenet reports a circinate skin eruption in two children suffering from rheumatic fever. The eruption in both instances was characterized by its temporary nature, lack of itching, sharply limited red border and sometimes by its roselike ring. From observation of the course of the eruption in these two patients he believes that marginal erythema in discoid plaques and annular erythema are merely two aspects of the same erythema.

Journal de Médecine de Lyon

17: 455-482 (July 5) 1936

*Critical Study of Experimental Cerebral Embolisms. Hermann and J. Dechaume.—p. 455.
Tuberculous Bacillemia and Erythema Nodosum. G. Graziosi.—p. 473.

Experimental Cerebral Embolism. — Hermann and Dechaume observed the effects of experimental carotid induced embolization and the resultant cerebral embolism on twenty-three dogs. The classic view that carotid embolization produces a cerebral embolization and a cerebral softening if the animal survives is well known. They succeeded in showing that in the cases in which embolization was rapidly fatal the embolism was encephalobulbomedullary. The choroid plexus and the hypophysis also were involved. Softening is not visible, but the lesions are complex and microscopic or macroscopic hemorrhages are especially conspicuous. The known physiologic and anatomic facts suggest the complexity of an experiment apparently as elementary as carotid embolization. Certainly the experimental embolism thus produced must be viewed with caution and be subject to revision. Such experiments demonstrate the possibility of producing paroxysmal hypertension by means of affecting directly the vasomotor centers in the cerebral-spinal axis, medullary centers, bulbar centers and, doubtless, other infundibulotuberian centers. The reality of such arterial hypertensions by directly affecting the central nervous system is established. The pathogenesis of hypertensions of cerebral origin observed in man in the course of cerebral vascular accidents may thus be revised. Finally, the need for accurate physiologic and anatomic control of such experimentation is especially indicated by the results of such experimental methods.

Presse Médicale, Paris

44: 1129-1144 (July 11) 1936

Anatomoroentgenologic Study of Myocardial Infarction: Three Cases. D. Routier, R. Heim de Balsac, F. Joly and J. Lemant.—p. 1129.
*Treatment of Severe Stenosis of Lower Third of Esophagus. J. Guisez.—p. 1133.
Histologic Diagnosis in Identification of Endemic Leprosy. J. Quérangal des Essarts and G. Lefrou.—p. 1136.
Mikulicz's Disease. P. Aboulker and A. Dreyfuss.—p. 1139.
Peruvian Verruca. G. O. Hercelles.—p. 1142.

Stenosis of Lower Third of Esophagus.—Guisez reports sixteen cases of traumatic cicatricial stenosis of the lower third of the esophagus after the swallowing of a caustic liquid and three cases of inflammatory stenosis following old spasms. The classic treatment by gastrostomy has many disadvantages. The simple spasmodic contractures can be cured or at least improved by dilation with different sized bougies. In the inflammatory types of stenoses, however, this treatment is unavailing. In such cases, circular electrolysis is of great help in allowing later dilation. In all those patients with gastrostomy observed by the author, it was possible by means of the treatment mentioned to close the gastrostomy wound and return to a normal method of feeding.

Schweizerische medizinische Wochenschrift, Basel

66: 757-776 (Aug. 8) 1936. Partial Index

Lymphatic System. W. Gloor-Meyer.—p. 757.
Results of Exercise in Treatment of Unilateral Paralysis of Larynx. R. Luchsinger.—p. 760.
*Serologic Changes in Patients with Liver Disease. R. Frèund.—p. 762.
Potent Ester of Testosterone. K. Miescher, A. Wettstein and E. Tschopp.—p. 763.
Clinical Aspects of Shock Effect of Lightning on Human Organism. Gladkoff and Ordinskaja.—p. 764.

Serologic Changes in Patients with Liver Disease.—Freund calls attention to the fact that certain characteristics of human serum are closely related to the hepatic function. Continuing former studies, he decided to investigate two properties of human serum that are largely dependent on the function of the healthy liver: (1) the constancy of the complement content and (2) its trypanocidal action. He made tests on the complement content of the serum of patients with and without hepatic disorders and gained the impression that it is dependent on a partial function of the liver and that this partial function permits a conclusion about the condition of the hepatic parenchyma. The curves obtained by serial tests on patients during certain disorders permit a conclusion as to whether the hepatic parenchyma has been impaired or is in a stage of restitution. The serum of patients with hepatic disease frequently shows a considerable reduction in the trypanocidal power. 1. It was found that the trypanocidal titer is closely related to the functional condition of the liver. 2. The trypanocidal substances or their preliminary forms are formed chiefly in the liver. 3. There is a parallelism between the complement titer and the trypanocidal titer. Thus it appears that the trypanocidal capacity of the human serum and its dependence on the liver represent also a partial function of the liver and one which is distinct from that manifested in the complement. In tests on 200 serums from patients with hepatic disorders and on a much larger number of controls, the author was able to convince himself again and again that the trypanocidal action of the

serum is closely connected with a not yet identified partial function of the liver. He emphasizes that the described serologic functional tests are important for the prognosis, particularly as regards the predisposition to infections. In tests on animals, he found that those with impaired liver have a greater susceptibility to subsequent infections than have normal animals.

Archivio per le Scienze Mediche, Turin

62: 1-96 (July) 1936

*Adventitial Diffusion of Tuberculosis, Especially Tuberculous Pulmonary Perilobulitis and Tramitis. M. Fenicia.—p. 1.
Orchiepididymal Tuberculosis. C. Giovanni.—p. 25.
Liposarcomas: Cases. A. Picco.—p. 47.
Functions of Liver in Chronic Bone Suppuration. R. S. Douglas and L. Morasca.—p. 57.
*Behavior and Significance of Hijmans van den Bergh Reaction in Heart Diseases. B. P. Giordano.—p. 81.

Adventitial Diffusion of Tuberculosis.—Fenicia states that the lymph nodes of the hilus of the lung are the first structures involved in the process of chronic pulmonary tuberculosis. From the nodes the infection spreads to the parenchyma of the organ through the lymphatic vessels and the tunica adventitia of the pulmonary arteries and veins and of the bronchi. The tunica adventitia of these structures belongs to the reticulo-endothelial system because of its structure, and to the lymphatic system because of its capillary and humoral circulations. The selective localization of chronic tuberculosis in the tunica adventitia of the pulmonary blood vessels with the consequent hyperplastic reaction results in the development of tuberculous hilitis, in certain cases of which a reaction of sclerosis takes place and the sclerosed tissue marks the contours of the interstitial pulmonary tissue (tuberculous tramitis) or those of the pulmonary lobes (tuberculous perilobulitis). The anatomic and histologic study of the lung in these conditions show the special aspects of the organ. The roentgenogram shows a fine network of lines of increased density covering the field of the lung. The shadows of the network correspond to the early tuberculous infiltration of the spaces that limit the lobes of the lung. The roentgenographic, anatomic and histopathologic aspects of the lung in tramitis and perilobulitis confirm the statement that pulmonary tuberculosis propagates itself from the hilus to the apex of the lung. Certain forms of chronic tuberculosis of the liver (the so-called tied up cirrhosis of the French authors) and of chronic tuberculosis of the uterus evolute in a form similar to that followed by tuberculous perilobulitis. The anatomopathologic pictures of the structures in these conditions are analogous to those of the pulmonary process. These facts show that the tunica adventitia of the blood vessels of the liver and the uterus is the route of propagation of chronic tuberculosis in these organs and that a specific reaction of sclerosis takes place during the process, as is the case also in pulmonary perilobitis.

Van den Bergh Reaction in Cardiac Patients.—Giordano made determinations of the bilirubin in the blood of patients suffering from decompensated heart disease by the van den Bergh reaction. He concludes that the quantity of bilirubin in the blood and the intensity of the reaction, whether direct or indirect, run parallel to the clinical evolution of the heart disease. Bilirubinemia and the intensity of the test increase with the aggravation and decrease with the improvement of the heart disease, especially in patients with decompensation of the right ventricle. The appearance of a direct reaction associated with increase of the bilirubin in the blood has an unfavorable prognostic significance for the patient's life.

Rivista Italiana di Ginecologia, Bologna

19: 213-310 (May) 1936

Peripheral Venous Pressure in Pregnancy and Puerperium. G. T. Rao.—p. 213.
Cesarean Section in Diffuse Purulent Peritonitis from Appendicitis. M. Bufalini.—p. 241.
*Biologic Action of Red and Ultraviolet Radiations on Substances in Urine of Pregnant Women. R. Bolaffi.—p. 249.
Interstitial Pregnancy: Cases. G. Micale.—p. 269.
Influence of Roentgen Rays on Pregnancy Urine: Evolution of Friedman Test Made with Irradiated Urine. R. Bolaffi.—p. 295.

Effect of Irradiation on Substances in Urine of Pregnancy.—Bolaffi's experiments were made on virgin rabbits, previously laparotomized and placed in two lots for investigation of the effects of red and ultraviolet radiation on the biologic activity of the gonadotropic and estrogenic substances contained in the urine of pregnant women. The author concludes that red radiations have no action on the gonadotropic substance, whereas they have a remarkable stimulating action on the estrogenic substance. Ultraviolet radiations have no action on the estrogenic substance, whereas they have an action on the gonadotropic substance by which the biologic activity of the latter is greatly diminished. The activation of the biologic action of the estrogenic substance by the red radiations and the weakening of the biologic action of the gonadotropic substance by the ultraviolet radiations are due to chemical and physical changes of the substances especially related to variations of their colloidal stability through photochemical and photobiologic effects of the radiations. The results of the author's experiments point to a subject of practical importance: the sensitivity of gonadotropic substance to ultraviolet radiations should be kept in mind with respect to the harmful influence that light may cause on the urine of pregnant women. When the latter must be used to make quantitative determinations for scientific or clinical diagnostic aims, it is advisable to use the urine as soon as possible after its elimination. If this is not possible the urine should be kept in a dark place to prevent alterations in the content or nature of the gonadotropic substance. The same precautions are advisable for the conservation of preparations for therapeutic purposes.

Anales de Medicina Interna, Madrid

5: 603-704 (July) 1936

*Metabolism of Creatine in Muscular Dystrophy. A. Fernández Cruz.—p. 603.
Dysionic Study of Experimental Gastritis and Gastric Ulcer: Alterations of Mineral Metabolism. J. A. Sánchez Martinez.—p. 629.
Perforation of Gastroduodenal Ulcer. M. Moya.—p. 669.
Does Chlorosis Exist? G. Marañón.—p. 677.

Metabolism of Creatine in Muscular Dystrophy.—Fernández Cruz says that there is a disturbance of the metabolism of creatine in progressive muscular dystrophy which appears as a characteristic syndrome of pathologic creatinuria and a diminished elimination of creatinine. The administration of aminoacetic acid (glycocoll) to these patients, for as long as it is necessary, produces a temporary increased creatinuria with consequent diminution of the elimination of the substance. Creatine, administered by mouth to these patients, is followed by elimination of the substance in proportion to the seriousness of the disease. The reaction shows that there is a creatinuric diabetes or intolerance to creatine in the condition. The administration of creatine by mouth can be used as a test for ascertaining both the degree of tolerance to creatine in patients suffering from muscular dystrophy and the condition of the muscular metabolism in patients suffering from myopathic pathologic conditions. In patients suffering from Addison's disease, there is an abnormal elimination of creatine by the urine and a diminished elimination of creatinine. The latter is found in ninety-six out of ninety-seven determinations made. Creatine, administered to patients suffering from Addison's disease, causes an increase of creatininuria and slight changes of creatinuria. The results of the test point out that, in patients suffering from asthenia in Addison's disease, qualitative changes of the muscular metabolism develop that are different from those which take place in muscular dystrophy. The hypofunction of the hypophysis can produce a muscular syndrome associated with specific alterations of the metabolism of creatine that are characterized by pathologic creatinuria and intolerance to exogenous creatine. In patients suffering from muscular dystrophy, injectable hepatic extracts increase the tolerance of the patients to creatine and decrease spontaneous creatinuria up to complete disappearance of the latter. Injectable adrenal extract administered to these patients does not produce modifications of creatinuria. In patients suffering from progressive muscular dystrophy the metabolism of carbohydrates is disturbed. Basal lactacidemia is high and still higher after physical exercise. The content of phosphagen, glycogen and lactic acid in the dystrophic muscles, studied by biopsy, is greatly diminished. Histopathologic studies of the muscles in progressive muscular dystrophy show processes of destruction of the muscular tissues, which are largely replaced by fatty tissue within inflammatory foci and areas of well preserved muscular tissues.

Prensa Médica Argentina, Buenos Aires

23: 1783-1830 (July 29) 1936. Partial Index

*Voluntary Apnea in Chronic Respiratory Insufficiency. M. R. Castex, E. L. Capdehourat and C. C. Devoto.—p. 1783.
Great Ascites from Hepatic Cirrhosis in Pregnancy. J. C. Lascano and J. C. Pereyra.—p. 1794.
Therapeutic Applications and Clinical Results of Sympathectomy (Olivares' Method of Chemical Anesthesia in Ophthalmology). E. Lluesma-Uranga.—p. 1800.
Vaginal Cesarean Section Twice Repeated As a Result of Detachment of Normal Placenta in Early Pregnancy: Case. J. Bazan and A. González Collazo.—p. 1806.
Retrovesical Hydatid Cyst: Case. F. E. Grimaldi.—p. 1808.

Voluntary Apnea in Chronic Respiratory Insufficiency.—Castex and his collaborators made determinations of the time of voluntary apnea in patients suffering from chronic respiratory insufficiency due to cyanotic bronchopneumocardiac disease. Apnea, especially following deep inspiration, causes slight bradycardia. The arterial pressure slightly increases at the end of the test of voluntary apnea, following inspiration, whether or not preceded by physical exercise. Apnea during rest and with the patients placed in the dorsal position has an influence on the development of the P wave in the electrocardiogram. In apnea, following deep inspiration, the altitude of the P wave is greatly increased, whereas in that which follows expiration the wave rises only slightly above the iso-electric line. An intravenous injection of 1 mg. of atropine (paralyzing dose) makes less remarkable the differences in the development of the P wave in apnea following inspiration and expiration, respectively. The results demonstrate a predominance of the vagus nerve as cause of the variations of the P wave in apnea following expiration and a predominance of the sympathetic in apnea following inspiration. The great elevation of the P wave during inspiration in comparison with that which occurs during expiration indicates good condition of the auricle and can be taken as an index for estimation of the auricular function.

Monatsschrift für Kinderheilkunde, Berlin

66: 1-106 (June 2) 1936

*Question of Fat as Cause of Digestive Disturbances in Artificial Feeding of Nurslings. U. S. Ružičić.—p. 1.
Occurrence of a Psychosis (Korsakow's Syndrome) After Pharyngeal Diphtheria. Gertrud Zimmermann.—p. 4.
Respiratory Arrhythmia in Children with Heart Disease. K. Kühne.—p. 7.
*Action of Nonspecific Factors on Agglutination Titer in Dysentery. R. Martyn.—p. 16.
Congenital Diffuse Rhabdomyomatosis of Heart in Two Brothers. W. Pauli.—p. 22.
Sino-Auricular Block in Child with Diphtheria. P. von Kiss.—p. 30.

Fat as Cause of Digestive Disturbances in Nurslings.—Ružičić directs attention to the alimentary disorders caused by cow's milk. He conducted experiments to determine whether the fat as such or together with the other constituents of cow's milk causes the nutritional disturbances. A tabular report of the results of the experiments indicates (1) that nurslings tolerate an unusually large amount of cow's milk when its fat content has been replaced by the fat of mother's milk and (2) that the fat of cow's milk causes no disturbances when it is given in previously defatted mother's milk. The author says that, to the extent that observations on two cases permit conclusions, it may be said that alimentary disturbances do not result from the fat of the cow's milk as such, but only when it is given together with the other constituents of cow's milk.

Agglutination Titer in Dysentery.—Martyn points out that the agglutination tests, which are employed for the serologic diagnosis of dysentery, have been highly evaluated by some but criticized by others. The agglutination can be influenced by a number of nonspecific factors. The author tested the blood serums of eighty nurslings and children who were free from dysentery for agglutination of the A, B, D and H strains of the Flexner Y group and of the Shiga dysentery bacillus. On the whole, he found in the different persons similar agglutination values. The H agglutinin usually had the highest values. In children, in whom it could be proved clinically and bacteriologically that they had had dysentery, the agglutination values were qualitatively and quantitatively the same as in nondysenteric children from six to twelve months after the dysentery. Various irritations, such as blood transfusion or the injection of certain substances, may produce a considerable increase in the agglutinins; however, in these cases the clumping is less compact and can readily be shaken apart. Moreover, this agglutination has no dysenteric character; there is no sign of a predominance of the agglutinins of the D and Shiga types. The agglutinins that appear under the influence of the aforementioned nonspecific irritants, as well as the increase of the agglutinins, are not identical with the processes that take place in specific agglutination.

Zeitschrift f. Geburtshülfe u. Gynäkologie, Stuttgart

113: 1-106 (June 23) 1936

Hydrosalpinx. O. Frankl.—p. 1.
Intestine and Genitals: Report About Some Diagnostically Difficult Cases. K. W. Schultze.—p. 21.
*Tubal Insufflation for Treatment of Sterility. H. O. Kleine.—p. 31.
*Prevention and Raising of Premature Births. H. Nevinny.—p. 37.
Management of Birth in Narrow Pelvis Following Rejection of Cesarean Operation. G. von Glinski.—p. 66.

Value of Tubal Insufflation in Sterility.—Kleine bases his evaluation of tubal insufflation on observations made in 146 cases. He stresses that tubal insufflation requires hospitalization, for its ambulatory employment or its use in general practice involves danger. He also rejects the therapeutic use of the method. A causal connection between conception and tubal insufflation can be asserted only if the following factors apply to the case under consideration: at least two years' existence of the sterility, conception not later than six months after the tubal insufflation, and exclusive use of insufflation without resort to other measures, such as curettage, the Alexander-Adams operation or laparotomy. The author thinks that the fact that after a positive insufflation conception takes place within the first six months in only 2 per cent of the cases but after negative insufflation in 14 per cent proves that tubal insufflation has no diagnostic value.

Prevention of Premature Births.—Nevinny says that extensive antepartum care is of great importance in the prevention of premature births. By means of it the relative frequency of immature single births, with extremely low weight, can be considerably decreased. However, since even with extensive antepartum care there will occur a considerable percentage of premature births, it remains important to find the best methods of raising premature infants. In order to understand better the most suitable methods of care during the first period after birth, the author discusses the metabolism during this time, particularly the protein and sugar metabolism and the initial loss of weight. His studies brought proof for the great fluid requirements of premature births, and he also observed that the fall and rise in the blood sugar curve runs parallel with the weight curve. In the treatment of premature infants he obtained good results with subcutaneous infusions of a slightly hypotonic solution of sodium chloride with the addition of a heart stimulant and of dextrose as a supply of energy. He illustrates the efficacy of this method by citing cases.

Zeitschrift für klinische Medizin, Berlin

130: 275-408 (June 30) 1936

*Relations of Experimental Agastric Anemia to Pernicious Anemia. J. Bence.—p. 275.
*Copper Content of Blood in Anemias. J. Bence, J. Lendvai and J. Székely.—p. 299.
Spectrographic Studies on Roentgen Sensitivity of Gastric Juice and of Several Water Soluble Vitamins. L. Karczag and M. Hanák.—p. 310.
Clinical Electrocardiography: Studies on Behavior of Electrocardiogram During Change from Reclining to Erect Position. G. Schlomka and H. Reindell.—p. 313.
Electrocardiogram During Agonal Stage in Human Subjects. T. Misao, N. Maéda, T. Tanaka, K. Noma and S. Itoh.—p. 332.
Electrical Conductivity of Human Skin. F. Brauch.—p. 338.
*Influence of Defects of Cardiac Valves on Life Expectancy. R. Friedmann.—p. 382.

Experimental Agastric Anemia and Pernicious Anemia.—In his observations on hogs, Bence found that following total gastrectomy there develops during the first stage, which lasts for about a year, an anemia with microcytic, hypochromic blood picture, largely resembling that of chloranemia. Later, during the second or third year there develops a progressive, megalocytic, hyperchromic anemia, which is combined with leukopenia, thrombopenia, icterus and urobilinogenuria. When the gastrectomized animals live long enough to enter the macrocytic stage, there develops in the medullary portion of the large tubular bones a severe red hyperplasia, which entirely replaces the fat marrow. This hyperplasia shows embryonal character

and correspondingly a severe, megalocytic erythropoiesis. The blood picture and the changes in the bone marrow are like those in pernicious anemia. In an animal in which at the age of 3 months 3 meters of the ileum and of the jejunum had been removed, the number of erythrocytes increased greatly as did also the hemoglobin, whereas the number of leukocytes remained unchanged. This experiment seems to indicate that the lower portion of the small intestine has no influence on the blood formation.

Copper Content of Blood in Anemias.—In studies on the copper content of the blood of anemic patients, Bence and his associates found that it is increased, whenever the functional activity of the bone marrow is intensified, regardless of whether the existing disorder is pernicious anemia, secondary anemia, leukemia or polyglobulism. The causal factor of this increased erythropoiesis is unimportant. The increase in the copper values is not a peculiarity of pernicious anemia, for the values change during this disorder with the decrease and increase in the number of erythrocytes. The fluctuations in the copper content are closely related to the increased or reduced activity of the bone marrow. Immediately after a hemorrhage the copper content is low, because during this stage of anemia the erythropoiesis of the bone marrow has not yet become completely established. A certain time is required until this mechanism becomes active. There are likewise high copper values in leukemia, during which an increased bone marrow function must be assumed. The copper values are increased whenever there is a numerical increase in the development of the erythropoiesis, and from this the authors conclude that copper or a substance containing copper is the chief factor in the numerical production of blood corpuscles. They assume the existence of two active principles in the erythropoiesis, in that copper directs the numerical production whereas the active principle of the stomach directs the activity of the bone marrow in the production of qualitatively normal erythrocytes.

Defects of Cardiac Valves and Life Expectancy.—Friedmann compared the mortality rate of patients with heart disease with that of the population on the whole. The index of the latter was designated as 100. The excess mortality for all patients with lesions of the cardiac valves was plus 164 per cent, that of patients with mitral defects was plus 143 per cent. The highest excess mortality of the cardiac lesions was observed in patients with combined valvular defects: in these it amounted to plus 226 per cent. In patients with aortic defects, the excess mortality rate was plus 88 per cent, the lowest of all lesions of the cardiac valves. The mortality from all valvular lesions was greatest in both sexes during the fifth decade of life. However, in patients with mitral insufficiency it did not reach the peak until the sixth decade. The author investigated also whether the life expectancy of patients with cardiac defects was dependent more on the age of the patient or on the duration of the cardiac defect. He found that the peak of excess mortality during the fifth decade was largely independent of the time of acquisition of the cardiac defect. However, it was quite noticeable that the degree of enlargement of the heart was of considerable influence on the life expectancy of patients with valvular lesions.

Zeitschrift für Tuberkulose, Leipzig

75: 225-304 (June) 1936

*New Methods of Surgical Collapse Therapy in Pulmonary Tuberculosis. K. Werwath.—p. 225.
*Significance of Pneumoperitoneum in Treatment of Pulmonary Tuberculosis. T. Rehberg.—p. 230.
Mutation of Tubercle Bacillus. H. Hoffmann.—p. 238.
Immunobiologic Processes in Infectious Diseases, Particularly in Tuberculosis. Rieckenberg.—p. 246.
Serum Coagulation Reaction of Weltmann. F. Fuente-Hita and E. Jubés.—p. 255.
Influence of Age on Serum and Tissue Changes in Tuberculosis. J. Zeyland and E. Piasecka-Zeyland.—p. 258.

New Collapse Therapy in Pulmonary Tuberculosis.—Werwath points out that artificial pneumoperitoneum was used at first only for diagnostic purposes but later was resorted to also in the treatment of severe cases of intestinal or peritoneal tuberculosis. He was induced to try it in pulmonary tuberculosis, because he observed that in pregnant women the increased abdominal pressure often improves the tuberculous processes of the lung. He reasoned that in cases in which pneumothorax and phrenic exeresis failed to produce a complete collapse an additional compression of the diaphragm from below would help to produce it. He also hoped that the use of the pneumoperitoneum would reduce the number of cases in which extensive thoracoplastic interventions would be necessary and, on the other hand, might yet help some of the patients whose general condition is so unfavorable that a thoracoplastic operation would not be possible. In discussing the technic of artificial pneumoperitoneum, the author emphasizes that it is much less dangerous than an extensive thoracoplastic intervention. To be sure, particularly in the first filling, caution is advisable, in that not more than 500 or 600 cc. of air is introduced into the abdomen. Depending on the condition of the heart, a preliminary treatment with cardiac stimulants might be advisable. When pneumoperitoneum is done the patient should be fasting and the intestine empty. It is advisable to introduce an intestinal tube about one hour before the intervention, so as to remove intestinal gases. An injection of morphine-atropine is given thirty minutes before. The local infiltration of the abdominal walls must be adequate so as to obviate reflex movements on the part of the patient and also to avoid unnecessary pain. The author introduces the needle in the hypogastric region, about the width of a hand below the umbilicus. The filling should begin while the patient is in the horizontal position. If it is well tolerated, the patient can gradually be brought into the sitting position. Should circulatory disturbances develop suddenly, the pelvis should be elevated at once. The first filling should be made on the operating table. The efficacy of the pneumoperitoneum is roentgenologically controlled during the next few days, and supplementary fillings of from 400 to 600 cc. (up to 1,500 cc., depending on the size of the abdomen) are given at intervals of from two or three days to two weeks, until the collapse is complete. As a rule, the resorption of the air is more rapid in the abdominal than in the thoracic cavity. The favorable results, which the pneumoperitoneum produced in some rather desolate cases, prompted this early report, for the author realizes that the relatively small number of cases and the short period of observation do not as yet permit a definite evaluation.

Pneumoperitoneum in Pulmonary Tuberculosis.—In this report Rehberg describes the histories of some of the patients in whom pneumoperitoneum was employed according to Werwath's method and discusses the various pulmonary processes in which this treatment is indicated. He employed it (1) in uncontrollable hemorrhages, whenever a pneumothorax or a greater collapse operation was impossible, and paralysis of the diaphragm alone was ineffective; (2) in tuberculous processes of the lower part of the lung, in which phrenic exeresis did not produce the desired effect; (3) in a number of cases in which pneumothorax had failed, and (4) in some cases of involvement of the upper part of the lung to intensify the effect of phrenic exeresis.

Wiener klinische Wochenschrift, Vienna

49: 1013-1036 (Aug. 14) 1936. Partial Index

Development of Reproductive Cells in Human Subjects. G. Politzer.—p. 1013.
*Cerebral Death in Chronic Pulmonary Tuberculosis in Light of Research on "Serous Inflammation." A. Sattler.—p. 1015.
*Treatment of Genuine Epilepsy with Antirabic Vaccine. M. Tyndel and M. Pasternak.—p. 1017.
Action of Antigonadotropic Hormone of Pineal Body on Rabbits. P. Engel and W. Buño.—p. 1018.

Cerebral Death in Pulmonary Tuberculosis.—Sattler states that in severe, chiefly exudative pulmonary tuberculosis with gelatinous and caseous pneumonia, he occasionally observed the sudden development of cerebral symptoms, characterized by disturbances of the consciousness, somnolence, psychic and motor unrest, pupillary symptoms, Babinski's phenomenon, pareses and so on. Stiffness of the neck and Kernig's phenomenon were usually absent. Headaches were rarely complained of. The patients usually died in less than six or seven days. The terminal stage was characterized by respiratory paralysis. Spinal puncture usually revealed increased pressure of the cerebrospinal fluid. Among six patients, whose clinical histories are described, there were two in whom the cultural examination of the spinal fluid revealed the presence of tubercle bacilli, whereas in the four others the results were negative. The necropsy revealed in all cases a cerebral edema but no

signs of a tuberculous meningitis. The author thinks that from the pathogenic point of view the cerebral edema represented a "serous inflammation" (in Eppinger's meaning of that term) of toxic origin. He suggests that the fact that tubercle bacilli are occasionally detected in the cerebrospinal fluid of such cases corroborates the true inflammatory character of the disorder, and he plans histologic studies (in analogy to Eppinger's studies on other organs) in order to find evidence for the vascular disturbance that is believed to be the pathogenic basis of such changes.

Treatment of Epilepsy with Antirabic Vaccine.—Tyndel and Pasternak point out that attempts have been made in recent years to use antirabic vaccine in the treatment of certain diseases of the nervous system, such as dementia paralytica, tabes dorsalis and epilepsy. They decided to try it in patients with genuine epilepsy, selecting ten patients varying in age between 21 and 43 years. The vaccine is prepared by inoculating rabbits with an emulsion of fixed virus, killing them after seven days and then preparing an extract of their brains and spinal cords. The epileptic patients were given daily, for sixteen days, subcutaneous injections of 8 cc. of the vaccine. On the whole, the treatment was quite well tolerated, but it had no effect on the epilepsy. In view of the failure of the antirabic vaccine treatment in ten epileptic patients, the authors reject this mode of treatment.

Vestnik Khirurgii, Leningrad

42: 1-284 (Nos. 117-118) 1936. Partial Index

*Ligation of Vessels in Continuity in Grave Gastroduodenal Hemorrhages. M. G. Kamenchik.—p. 91.
Immediate and Late Results of Cholecystectomy Without Drainage. D. P. Kuznetskiy.—p. 155.
Internal Drainage in Treatment of Pancreatic Cyst. M. V. Krasnoselskiy.—p. 163.
Symptoms, Pathology and Surgical Treatment of Malarial Splenomegaly. M. B. Topchibashev.—p. 173.
*Recurrence of Nephrolithiasis. P. D. Sokolov.—p. 191.
Characteristics of Study of Nerve Supply of Extremities. V. N. Shevkunenko and A. N. Maksimenkov.—p. 200.

Control of Grave Gastroduodenal Hemorrhages. — In order to demonstrate the effectiveness of Witzel's method of ligation of arteries in continuity for the control of grave gastroduodenal hemorrhages, Kamenchik performed ligations in forty-two cadavers and studied the effect in roentgenograms taken after filling the gastric and the duodenal vessels with contrast material. He found that in order to prevent the contrast material from entering the ligated segment it was necessary to make multiple ligations not only of the main arterial trunk but of its branches as well. This method, first proposed by Witzel, is indicated in life-threatening hemorrhages caused by ulcers of the lesser curvature which did not penetrate into the substance of the pancreas. The vessels to be ligated are the left and the right gastric arteries and their anterior and posterior branches. Ligation of the gastroduodenal, the right gastro-epiploic and the superior pancreaticoduodenal arteries is suggested for the control of hemorrhage caused by duodenal ulceration. In those cases in which the ligation of the pancreaticoduodenal artery is not possible because of dense adhesions between the duodenum and the pancreas, a duodenotomy with suture of the ulcer is preferable. Of twelve patients with grave hemorrhages treated by this method, four died. The cause of death was not due to persistent bleeding in three, while in one case it was the result of failure to ligate the gastroduodenal artery. The success of the method depends on the timely intervention and completeness of the operation.

Recurrence of Nephrolithiasis. — According to Sokolov, the so-called kidney stone diathesis, resulting from a disturbance of the albumin or the water-salt metabolism, is responsible for the unpreventable recurrence of renal stones in a number of patients. Bilateral nephrolithiasis according to various authors occurs in from 14 to 15 per cent. In the author's material of 458 instances of stones in the kidney and the ureter there was an incidence of 8.58 per cent of bilateral occurrence. He estimates that about 25 per cent are not true recurrences but cases in which small stones or fragments of stone were overlooked during the operation. The operative intervention in itself with the consequent trauma to the kidney and the pelvis, the stasis and infection of the urine, constitute favorable conditions for the new formation of stones. Disturbance of the calcium-phosphorus metabolism on the basis of hyperparathyroidism has lately been considered a factor in the primary formation of kidney stones as well as in their recurrence. Among the important prophylactic measures the author stresses a delicate careful technic in the removal of stones excluding the possibility of overlooking bone spicules, careful roentgenologic revision of the kidney on the operating table, effective measures against urinary stasis and infection and the proper diet. Even more important is the study of individual factors in each case.

Hygiea, Stockholm

98: 465-496 (July 31) 1936

*Contribution to Knowledge of Spastic Ileus. K. Boman.—p. 465.
Rhinolithiasis. A. Bergstrand.—p. 475.
Additional Case of Choleic Acid Enterolith. J. Hellström.—p. 480.
Thrombosis and Jaundice. Gösta Hultqvist.—p. 483.

Spastic Ileus.—In Boman's patient, a man aged 23, with a wound infection in one foot but no gastric disorder and in good general condition, a disturbance with a picture of high ileus set in and resisted conservative treatment. On operation, the upper loop of the jejunum showed a sharp transition between a proximal dilated, reddened intestinal portion, including duodenum and stomach, and a distal pale and collapsed portion. At the place of transition a round anemic edematous efflorescence appeared, followed by a contraction ring, which obstructed the lumen; on palpation this disappeared, to be followed by another spasm in the same manner. The spasm is ascribed to a circulatory disturbance, and the circulatory disturbance in the intestine is regarded as a partial phenomenon of a general circulatory disorder expressed by the shocklike condition of the patient at the onset. This disturbance is attributed to intoxication from the wound with its breaking down products. A doubly fenestrated soft catheter was introduced in the stomach for drainage. Attempts to improve the circulation by administration of fluids and other means, and use of spasmolytics and other preparations to restore intestinal tonus through the vegetative system were without effect. On the sixteenth day the patient died in a new attack with collapse, falling temperature, pain and hiccups, together with marked aggravation of the general condition, small pulse and tachycardia. Necropsy failed to reveal any mechanical cause of the ileus or other positive results.

Norsk Magasin for Lægevidenskapen, Oslo

97: 785-896 (Aug.) 1936

Titrations of Sexual Hormone Preparations and Their Practical Value: Review Based on 110 Titrations. L. Gram.—p. 785.
Papillomas of Renal Pelvis. G. Ulland.—p. 820.
*Fatal Outcome of Pyelography? G. Ulland.—p. 827.
*Gee-Herter's Disease: New Casuistic Contribution from Medical Division A of Rikshospital. O. K. Evensen.—p. 830.

Fatal Outcome of Pyelography?—In his report of a case of bilateral dilatation of the renal pelvis and the ureters due to cancer of the seminal vesicles, with stricture of the ureter orifices, in which urography with neo-iopax was followed by uremic symptoms and which proved fatal on the fourth day, Ulland stresses the need of caution in the use of urography in bilateral renal disturbances, especially if there are signs of insufficiency.

Gee-Herter's Disease.—Evensen reports the case of a man, aged 22, with a history of increasingly frequent periods of abundant, porridge-like light stools since the age of 12, who was admitted to the medical division A of the Rikshospital for carpopedal spasms. His twin sister was treated for Gee-Herter's disease in the same division seven years earlier. The patient was mentally and physically somewhat infantile, with a large abdomen, reduced liver dulness, rigidity and hypertony of musculature. Roentgen examination showed a large, dilated colon, open sutures in the cranium, deficient epiphysial lines of the extremities, and large and coarse spongiosa network everywhere. After the administration of 50 Gm. of dextrose, the blood sugar curve showed the characteristic low increase. Hypochromatic anemia responded fairly well to treatment with iron. During treatment with calcium preparations and cod liver oil the blood calcium rose from 6.4 mg. per hundred cubic centimeters in April 1934, to 9.45 mg. per hundred cubic centimeters in August 1934. The blood phosphorus remained within normal limits. The patient's weight was increased 6 Kg. and his height 1.5 cm.